SUZUKI OUTBOARD MOTOR

SUZUKI DIAGNOSTIC SYSTEM

OPERATION MANUAL

For Software Version 6.00

99517-03062-01E

FOREWORD

This manual describes how to operate SDS (Suzuki Diagnostic System) Ver.6.00.
Besides the existing diagnostic functions and the calibration function of the outboard motor DF300 electronic control system, SDD_Ver.6.00 additionally provides the automatic installation function of USB adapter driver, newly incorporates the operation manual in the form of electronic file, and supports Windows Vista®.
For proper SDS operation, read this manual carefully to understand its contents so that you can provide your customers with accurate and prompt services.

NOTE:
- *This manual is edited based on the information available at the end of July 2008.*
- *This manual is subject to change without notice.*
- *Use this manual with the latest Service Manual of each model.*

SUZUKI MOTOR CORPORATION

Quality Administration Department

GROUP INDEX

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2	SYSTEM OUTLINE	2
3	INSTALLATION	3
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6	UNINSTALLING SDS	6

IMPORTANT

⚠WARNING/CAUTION/NOTE

Please read this manual and follow its instructions carefully. To emphasize special information, the symbol ⚠ and the words WARNING, CAUTION and NOTE have special meanings. Pay special attention to the messages highlighted by these signal words.

⚠ WARNING
Indicates a potential hazard that could result in death or injury.

CAUTION
Indicates a potential hazard that could result in motor damage.

NOTE:
Indicates special information to make maintenance easier or instructions clearer.

Please note, however, that the warnings and cautions contained in this manual cannot possibly cover all potential hazards relating to the servicing, or lack of servicing, of the outboard motor. In addition to the WARNING and CAUTION stated, you must use good judgement and basic mechanical safety principles.

Precautions for use

- This software is only used for outboard motor with DC 12V battery. Do not use for outboard motors with other than DC 12V battery.
- This software is specially designed for SUZUKI outboard motors. Please apply this software to the outboard motors only.
- Do not wet the diagnosis harness, USB adapter, personal computer, etc.
- Do not disassemble/modify the diagnosis harness, USB adapter, etc.
- Do not connect the diagnosis harness, USB adapter, etc. to the outboard motor or personal computer, unless SDS is in use.
- Use SUZUKI genuine special tools for outboard motor, when handling the diagnosis harness, USB adapter, USB cable etc.
- Always hold the coupler with both hands, when disconnecting the diagnosis harness from the connector on the outboard motor. Broken wire may occur, if the cable is pulled.
- Do not connect/disconnect the interface cable with a wet hand, or electrical shock or injury may happen.
- Do not leave USB connector in direct sunlight or high temperature circumstance.
- Do not drop or apply strong shock to USB adapter.
- Do not stick engine oil, gasoline, battery electrolyte to USB adapter, cable, etc.
  Do not wipe them with solvent such as thinner.
- If there is an abnormal condition such as smoke or smell from USB adapter or diagnosis harness, please immediately stop the usage.
- Do not use the diagnosis harness, USB adapter, etc., which has broken sheathing.
- Make sure that the main switch of outboard motor and the power of personal computer are “OFF”, before connecting the diagnosis harness, USB adapter, USB cable, etc.
- Do not operate SDS with driving the boat, or collision accident may occur.
- If BCM simulator harness is connected to the battery in an incorrect sequence or at incorrect poles, equipments may be damaged. The harness must be connected to the battery in the correct manner.
- The engine switch must be turned OFF, before connecting/disconnecting BCM simulator harness.

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1. OVERVIEW

1-1. APPLICABLE MODELS AND NECESSARY TOOLS

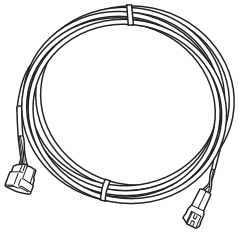
The table below lists application models and necessary tools.
The numbers in the “Necessary Tool” column correspond to the tool numbers in the figure shown below.

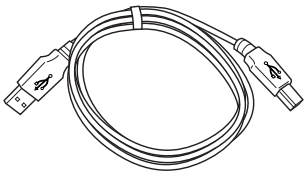
MODEL NAME	MODEL YEAR	NECESSARY TOOL	
			O_2 FEEDBACK
DF40/50	1999 and later	①, ②, ③, ④, ⑤, ⑧	⑥, ⑦ (A), ⑧
DF60/70	1998 and later	①, ②, ③, ④, ⑤, ⑧	⑥, ⑦ (B), ⑧
DF70A/80A/90A	2009	①, ②, ③, ⑤, ⑧	
DF90/115	2001 and later	①, ②, ③, ④, ⑤, ⑧	⑥, ⑦ (C), ⑧
DF100	2009	①, ②, ③, ⑤, ⑧	
DF140	2002 and later	①, ②, ③, ④, ⑤, ⑧	⑥, ⑦ (C), ⑧
DF150/175	2006 and later	①, ②, ③, ④, ⑤, ⑧	⑥, ⑦, ⑧
DF200/225/250	2004 and later	①, ②, ③, ④, ⑤, ⑧	⑥, ⑦, ⑧
DF250S	2008 and later	①, ②, ③, ⑤, ⑧	
DF300	2007 and later	①, ②, ③, ⑤, ⑧, ⑨	

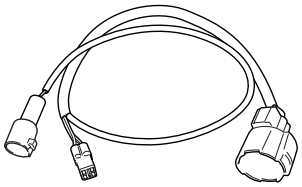
NOTE:
No conversion adapter (09933-19880) is required for 2008 year model and later.

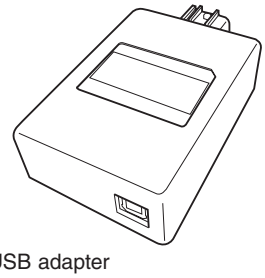
① 

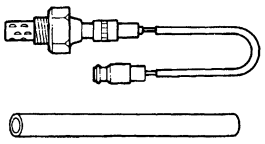
Suzuki Diagnostic System
Software Ver.6.00
09933-19862

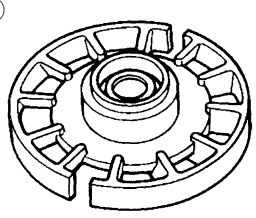
② 
Diagnostic harness
09933-19840

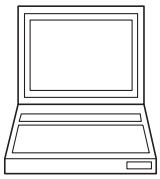
③ 
USB cable
09933-19850

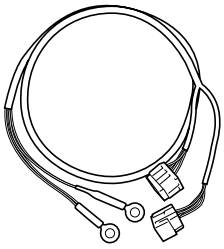
④ 
Conversion adapter
09933-19880

⑤ 
USB adapter
09933-19830

⑥ 
O_2 sensor 18213-74F00
Protector 18498-90J20

⑦ 
Test wheel
(A)09914-79410 (DF40/50)
(B)09914-79511 (DF60/70)
(C)09914-79010 (DF90/115/140)

⑧ 
Laptop computer supporting
USB ports

⑨ 
BCM Simulator harness
09930-89860

⑩
SDS Set
09933-19812
- Suzuki Diagnostic System Software Ver. 6.00
- Diagnostic harness
- USB cable
- USB adapter
- Conversion adapter

Relationship between SDS software, databases, and models

Model	SDS software Ver.4.00				SDS software Ver.5.00	SDS software Ver.6.00
	Database Ver.4.00	Database Ver.4.10	Database Ver.4.20	Database Ver.4.30	Database Ver.5.00	Database Ver.6.00
DF40/50	○	○	○	○	○	○
DF60/70	○	○	○	○	○	○
DF70A/80A/90A	×	×	×	×	×	○
DF90/115	○	○	○	○	○	○
DF100	○	○	○	○	○	○
DF140	×	○	○	○	○	○
DF150/175	×	×	×	○	○	○
DF200/225/250	×	×	○	○	○	○
DF250S	×	×	×	×	○	○
DF300	×	×	×	×	○	○

1-2. PC HARDWARE REQUIREMENTS

Running the SDS program requires the following environments:

Personal computer (PC)

DOS/V PCs (PC-AT compatible machines) where Windows 2000 or Windows XP operates as OS and that come with the following CPUs:
Windows 2000: Pentium 133 MHz or higher (Pentium 233 or higher MHz recommended)
Windows XP: Pentium 300 MHz or higher (Pentium 500 MHz or higher recommended)
Windows Vista: Intel (Core Solo, Core2, Duo, etc.)/1.6 GHz or higher (2.0 GHz or higher recommended)

Memory

Windows 2000: 64 MB or more (128 MB or more recommended)
Windows XP: 128 MB or more (256 MB or more recommended)
Windows Vista: 1 GB or more

Hard disk

20 MB or more of free space (40 MB or more of free space recommended)

Display

SVGA (800 x 600 pixels, 65,000 colors or more)

Drive

CD-ROM drive

Interface port

“USB x 1CH” or more required

* If two or more communication ports exist, they may be able to be used for infrared communication. Check that these communication ports are usable by referring to individual personal computer manuals.

Recommended environment

Environment in which you can run the SDS program without feeling uncomfortable with the file processing speed and screen display.

NOTE:

- *Depending on your PC environment settings, you may feel uncomfortable with the operation speed.*
- *The necessary memory capacity and hard disk capacity may depend on the system environment. Also running an SDS program when there is not enough space on the hard disk may cause your PC to run out of memory or encounter other problems during operation.*
- *Some PC models may not operate or may be unable to display data correctly depending on their operating environments.*
- *Use a small system font.*
- *Do not start the SDS program when another application is running.*
- *Do not use the screen saver.*
- *Do not use energy saving mode.*
- *When replacing the ECM or BCM, exit the system (program).*
- *For Windows Vista, use the existing scale (96 dpi).*

1-3. ABBREVIATION

Abbreviations used in this operation manual are as follows.

ABBREVIATION	FULL TERM
BCM	Boat control Module
CKP sensor	Cranckshaft position sensor
CMP sensor	Camshaft position sensor
CPU	Central Processing unit
CTP switch	Close Throttle Position switch
Cyl.	Cylinder
DBW	Drive By Wire
ECM	Engine control Module
ESA	Electronic Shift Actuator
ETV	Electronic Throttle Valve
Ex.	Exhaust
HRS.	Hour(S)
IAC valve	Idle Air Control Valve
IAT sensor	Intake Air Temperature sensor
Info.	Information
INJ.	Injection
MAP sensor	Manifold Absolute Pressur sensor
MANI	Manifold
MB	Mega-Byte
mcc	Mili-cubic centimeter
MIN.	Minute
MTR	Motor
NO.	Number
OCV	Oil Control Valve
PC	Personal computer
PORT	Port side
RPM	Revolution Per Minute
SDS	Suzuki Diagnostic System
SNSR	Sensor
SPC	Suzuki Precision Control
STBD	Starboard
Temp	Temperature
TPS	Throttle Position Sensor
TRGT	Target
μs	Micro-second
Mov	Move

2. SYSTEM OUTLINE

Connect your PC to the ECM or BCM of the outboard motor by using the following special tools (Fig.1):

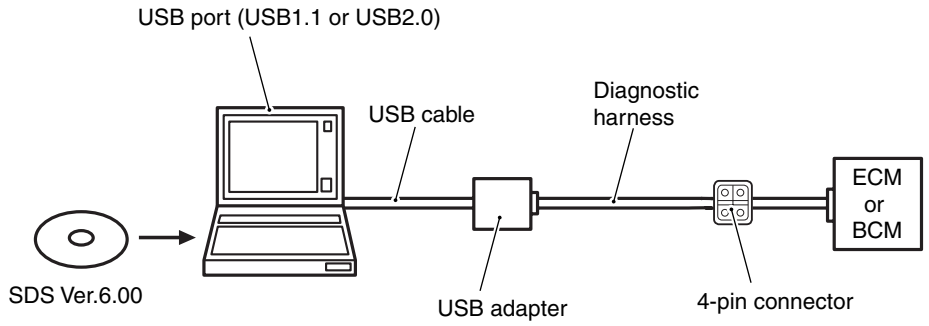


Fig.1

SDS performs communication between a PC and the ECM (Engine Control Module) or BCM (Boat Control Module) of the outboard motor via the diagnostic harness and USB adapter to provide the following information through ECM and BCM storage data and sensor data:

- **Engine information display**
- **Current service (self-diagnostic) codes**
- **Service data display and save**
- **Actuator test (forced start and stop of actuator)**
- **BCM simulator**
- **Data logger save and graph printing**
- **SPC system calibration**
- **SPC system initialization**
- **BCM service data display and save**
- **SPC system check**

NOTE:

- *Read the Operation Manual before starting SDS.*
- *Observe "IMPORTANT NOTICE" and "GENERAL INSTRUCTIONS" written in the Operation Manual.*
- *This software is designed for use with a battery-powered (DC-type) lap top personal computer. Do not use an AC-type personal computer.*
- *This software cannot operate on some PCs, depending on their operating environments.*
- *Always follow the instruction displayed in windows.*

3. INSTALLATION

3-1. INSTALLING SDS

BEFORE INSTALLING SDS

Check that the PC on which to install SDS software meets the operating environments of SDS before installing SDS.

1. Exit all the applications being executed other than Windows.
2. Insert the install disk for SDS Ver.6.00 into your CD-ROM drive.
3. Double-click the My Computer icon and then the CD-ROM Drive icon.
4. Double-click the “Setup” icon in the setup disk. This will copy files required for application installation to prepare for the SDS installation. (Fig.2, Fig.4)

NOTE:
For Windows Vista, when executing “Setup”, the user account control screen (Fig.3) is displayed.
Clicking “Allow” continues the setup, while clicking “Cancel” aborts the setup.

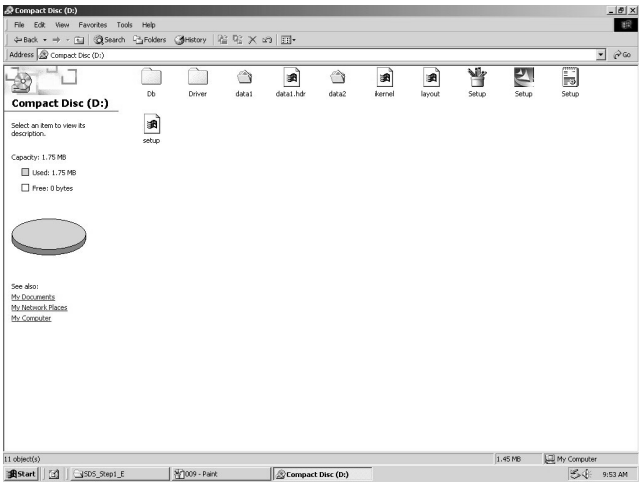


Fig.2

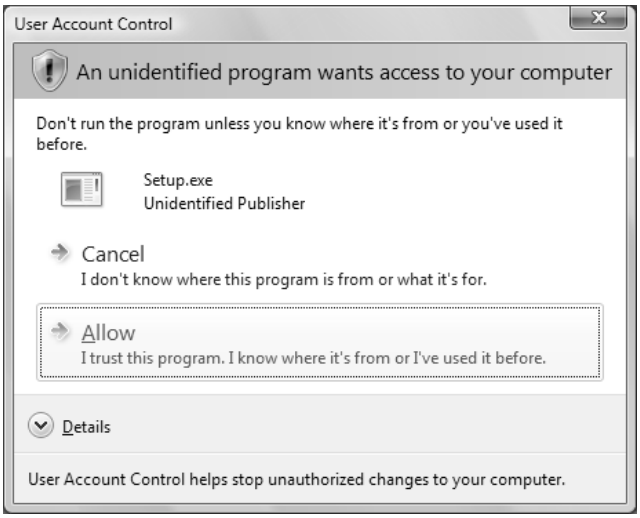


Fig.3

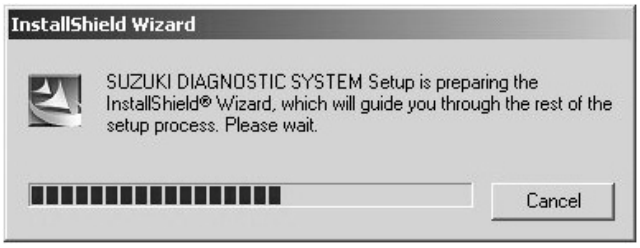


Fig.4

5. To continue the installation, click the “Next” button to proceed to the next step. (Fig.5)

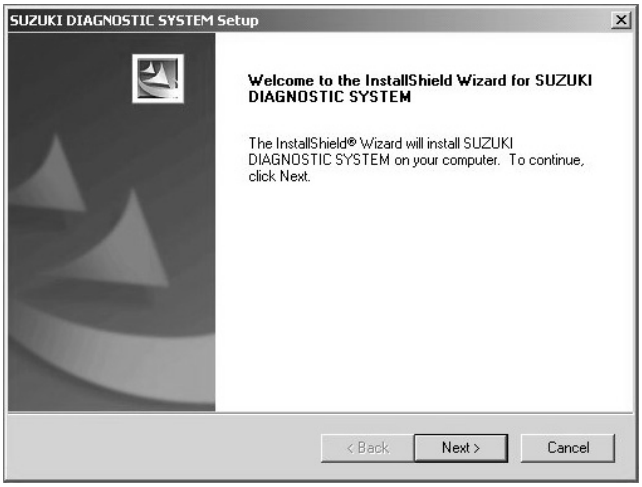


Fig.5

NOTE:
If SDS is already installed on your PC, the window shown in Fig.6 appears.
Clicking the “Yes” button in this window (Fig.6) continues the setup and the Wizard proceeds to the next step.
Clicking the “No” button quits the installation.

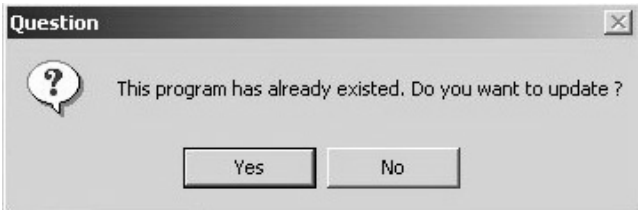


Fig.6

NOTE:
Clicking the “Cancel” button displays the Exit Setup dialog box shown in Fig.7.
To quit the installation, click the “Yes” button.

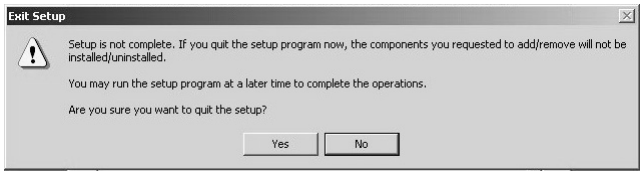


Fig.7

6. The confirmation window for the installation destination folder and program folder appears. (Fig.8)
   To continue the installation, click the “Next” button.
   File copy is started. (Fig.9)

NOTE:
To go back to the previous window, click the “Back” button.
To quit the installation, click the “Cancel” button.

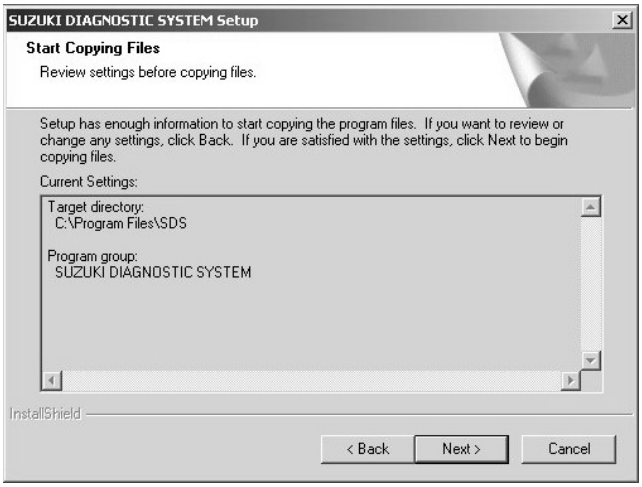


Fig.8

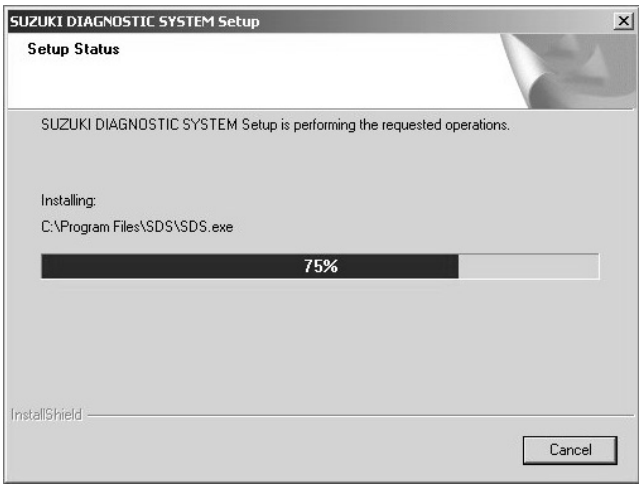


Fig.9

7. The installation of SDS_Ver 6.00 software is complete. (Fig.10)
   Click “Finish” button to install USB_Adapter_ Driver

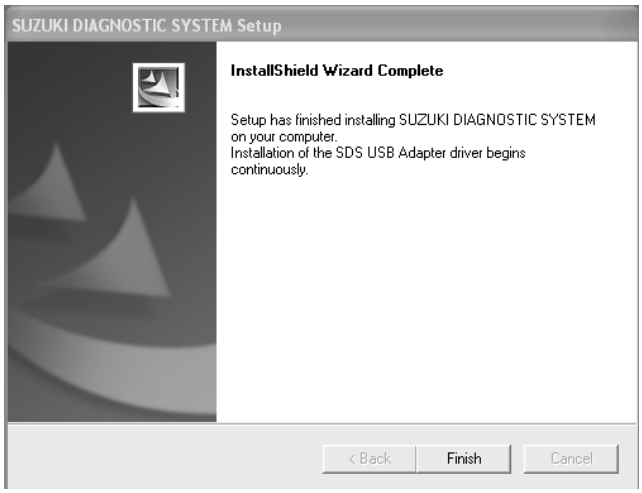


Fig.10

NOTE:
If SDS_Ver 5.00 has been already installed, the personal computer displays the completion screen (Fig.11) and the installation of USB_Adapter_Driver is not required.

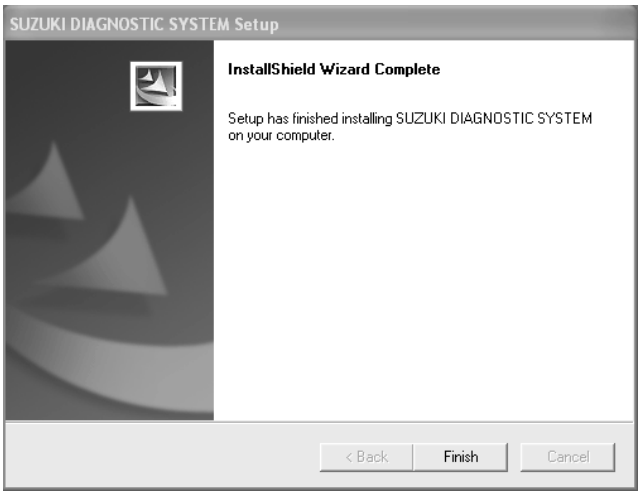


Fig.11

NOTE:
If an error occurs during SDS software installation, the warning screen (Fig.12) is displayed.
In this case, re-execute the installation from step 1.

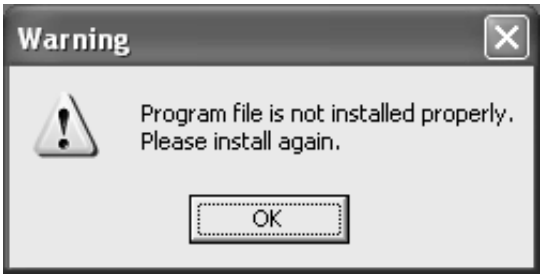


Fig.12

8. Install wizard screen of device driver is displayed. (Fig.13)
   At this stage, the temporary registration of driver is performed.
   When continue the installation, click “NEXT” button.
   The installation of driver starts. (Fig.14)

Fig.13

NOTE:
This installation is for temporary registering the device driver. Connection between outboard motor and personal computer is not required for the temporary registration of the driver.

• Temporary registration of driver;
With SDS_USB_Adapter and its cable disconnected from USB port of computer, copy USB driver into the computer.

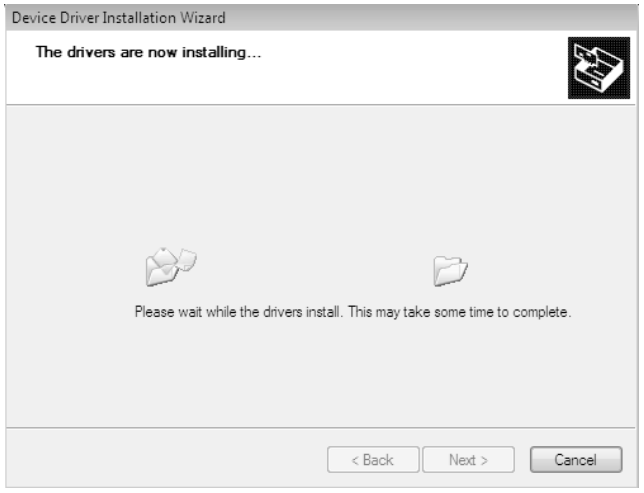


Fig.14

NOTE:
For Windows XP, the confirmation screen of installation (Fig.15) is displayed.
Clicking "Continue" button continues the installation, while clicking "Stop" button abort the installation.
For Windows Vista, the security confirmation screen (Fig.16) is displayed. Clicking "Install this driver software" button continues the installation, while clicking "Don't install this driver software" button abort the installation.

Fig.15

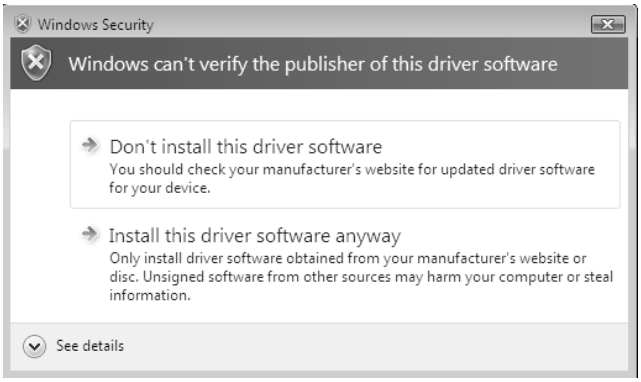


Fig.16

9. When the installation is correctly performed, the screen as shown in Fig.17 is displayed.
   Clicking "Finish" button completes the installation.

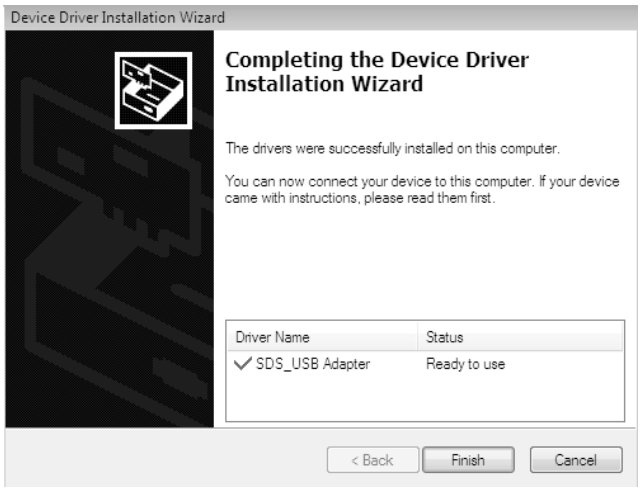


Fig.17

NOTE:
If an error occurs during installation of USB_Adapter_Driver, the warning screen (Fig.18) is displayed.
In this case, re-install the device driver as follows:

Fig.18

For Windows 2000/XP:

1. Start Button → click “Run”
2. Enter [C:Program Files\SDS\Driver\DPInst.exe] into Open column. (Fig.19)
3. Clicking “OK” button to execute.

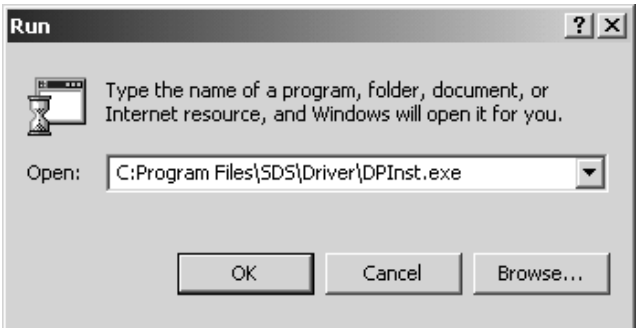


Fig.19

For Windows Vista:

1. Start Button → All Program Files → Accessories → Click “Run” (Fig.20)
2. Enter [C:Program Files\SDS\Driver\DPInst.exe] into Open column. (Fig.21)
3. Clicking “OK” button to execute.

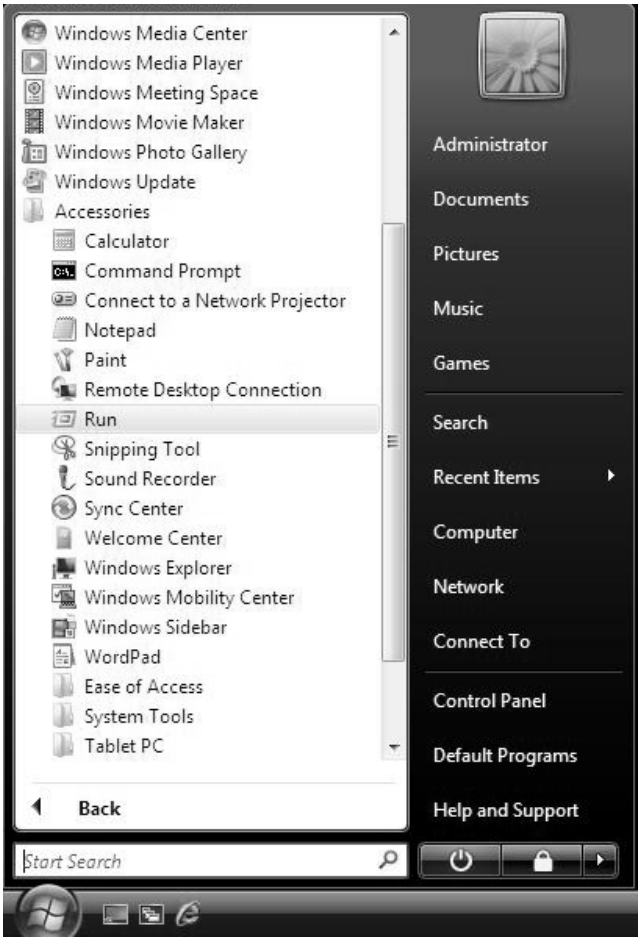


Fig.20

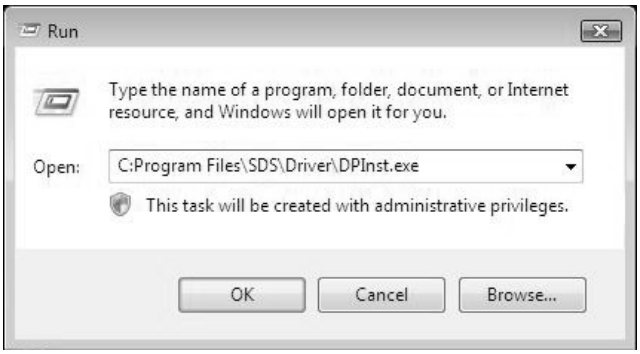


Fig.21

3-2. INSTALLING THE SDS USB ADAPTER DRIVER

1. Connect the diagnostic harness and USB cable (with a USB adapter) to the USB port of your PC and communication connector (4-pin connector).

2. Turn on the Main switch. After a while, a new hardware detection wizard appears. Check that “No, not this time” is selected and then click the “Next” button. (Fig.22)

Fig.22

For Windows Vista:
“Installing device driver software” is displayed on the lower right corner and the installation of driver automatically starts. (Fig.23)

Fig.23

After the installation of driver is completed, “Device driver software installed successfully” is displayed on the lower right corner. (Fig.24)

Fig.24

NOTE:
• Registration of driver;
With SDS_USB_Adapter and its cable connected to USB port of computer, register this device information into the computer.

3. When another new hardware detection wizard (Fig.25) appears, check that “Install software automatically (recommended)” is selected and then click the “Next” button.

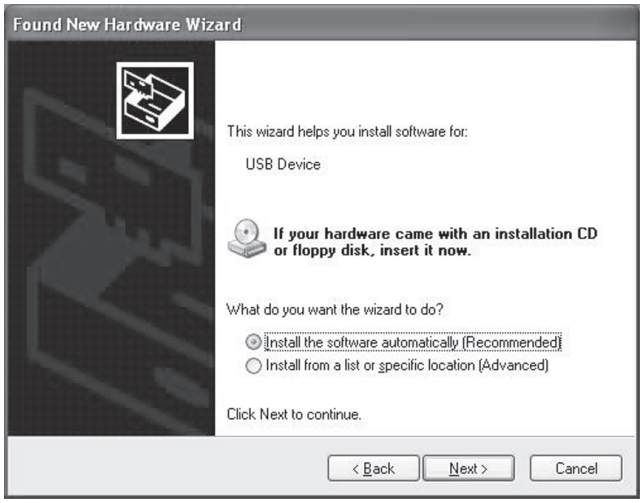


Fig.25

4. The Driver Installation window (Fig.26) appears and driver installation begins.

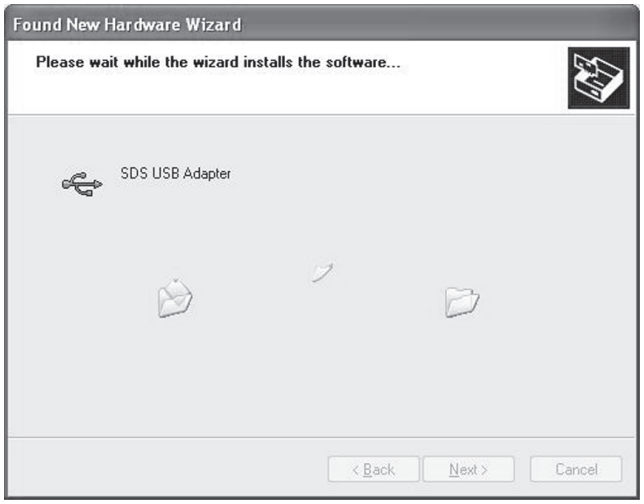


Fig.26

5. The Hardware Installation window (Fig.27) appears. To continue the driver installation, click the “Continue Anyway” button.
   Clicking the “STOP Installation” button stops the driver installation.

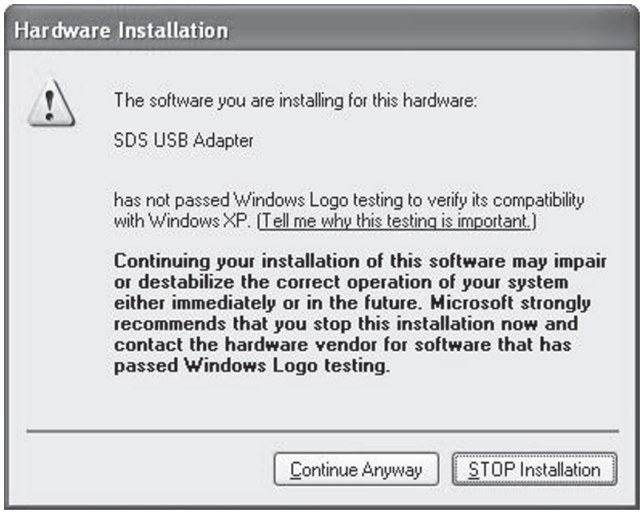


Fig.27

6. The Driver Installation Completion window (Fig.28) appears.
   Click the “Finish” button.

Fig.28

7. To make sure that the SDS USB Adapter driver is correctly installed, from the menu opened by right-clicking “My Computer”, select “Property” - “Hardware” - “Device Manager” to open the Device Manager window. (Fig.29)
   Check that “USB (Universal Serial Bus)” and “SDS USB Adapter” are created under “Device Manager” in the window.

NOTE:
For confirming SDS USB adapter driver in Device Manager, turn “ON” the main switch with the outboard motor and PC connected.

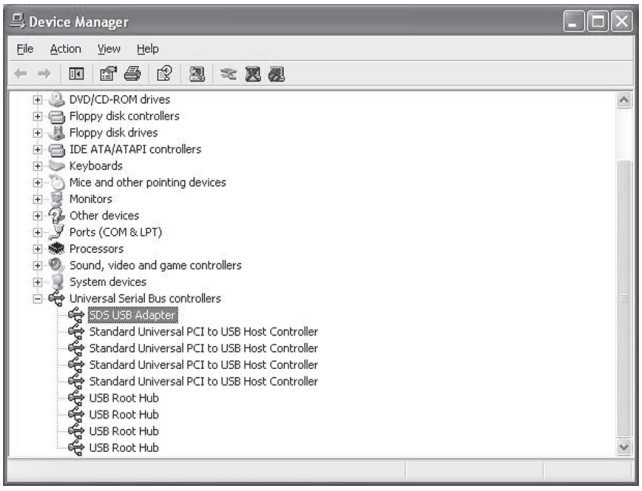


Fig.29

3-3. UPDATING DATABASES

1. Exit all the applications being executed other than Windows.
2. Click the Start button, point to “Programs”, and click “SUZUKI DIAGNOSTIC SYSTEM” from the displayed menu. (Fig.30)

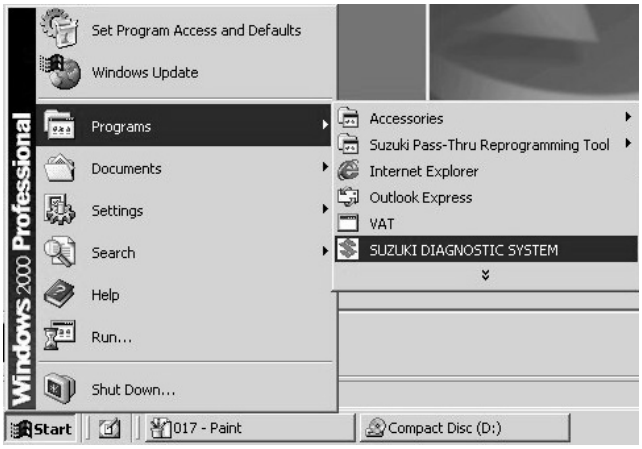


Fig.30

3. The SDS program is started. (Fig.31)

NOTE:
Do not update the database when your PC is connected to the ECM or BCM of the outboard motor.

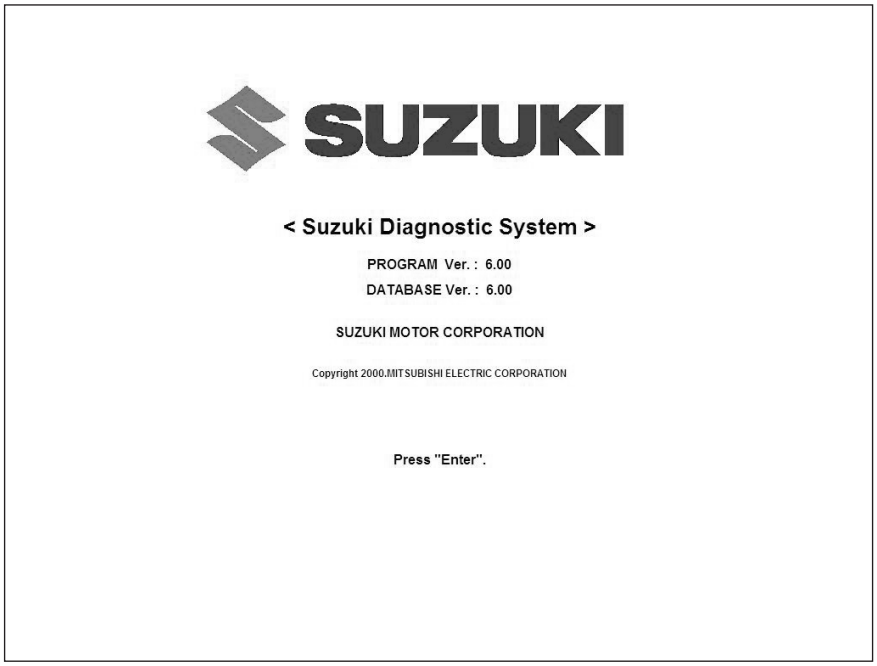


Fig.31

4. Press the “Enter” key to display the next window. (Fig.32)

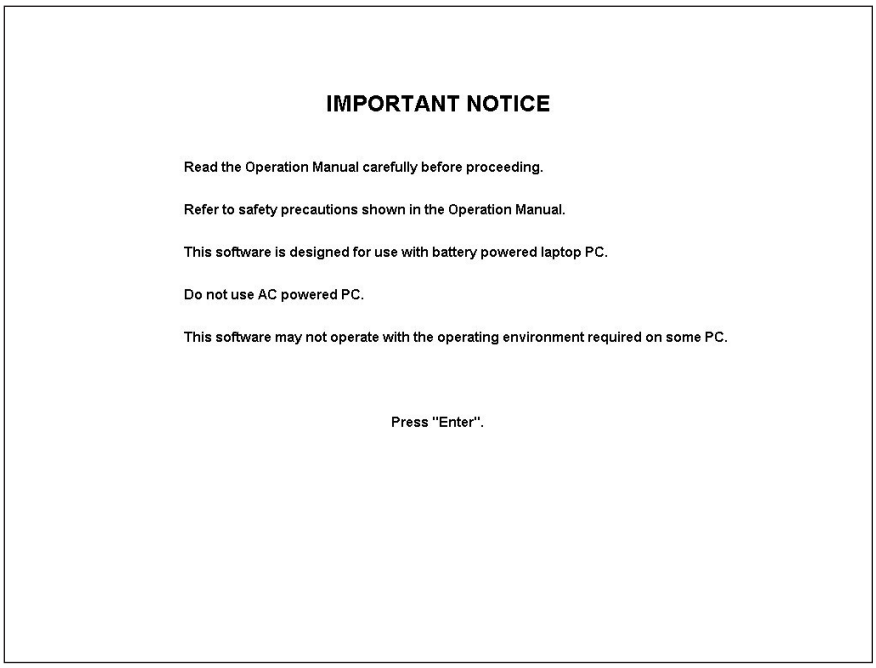


Fig.32

5. Press the “Enter” key to display the next window. (Fig.33)

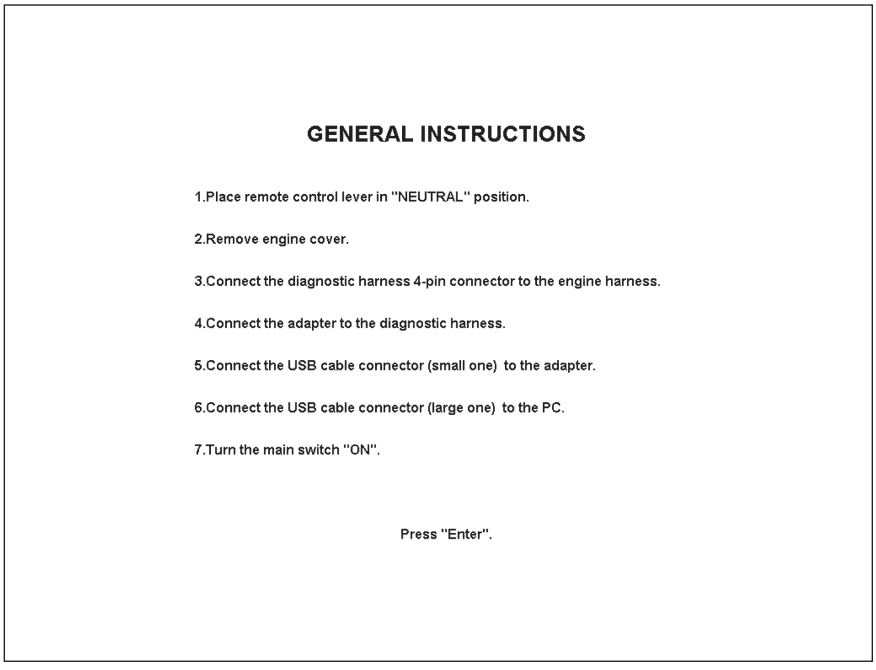


Fig.33

6. Pressing the Enter key displays the Communication Error dialog box. (Fig.34)
   Click the “OK” button to proceed to the next step.

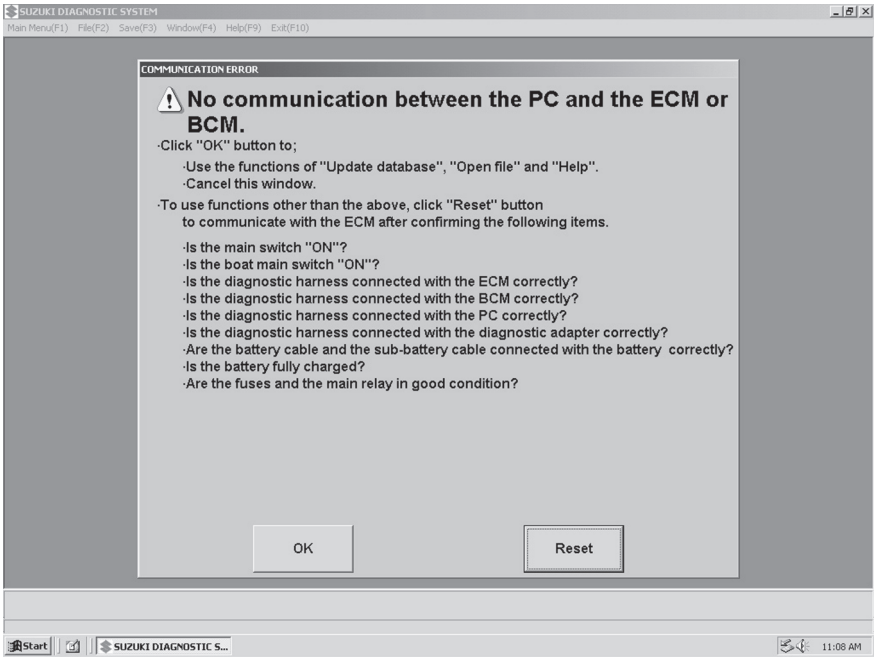


Fig.34

7. Insert the SDS database disk (compact disk) into the CD-ROM drive of your PC.

NOTE:
A new database overwrites the old database.

8. Click the “File(F2)” button in the upper left of the dialog box.
   From the submenu, select and click “Update database”. (Fig.35)

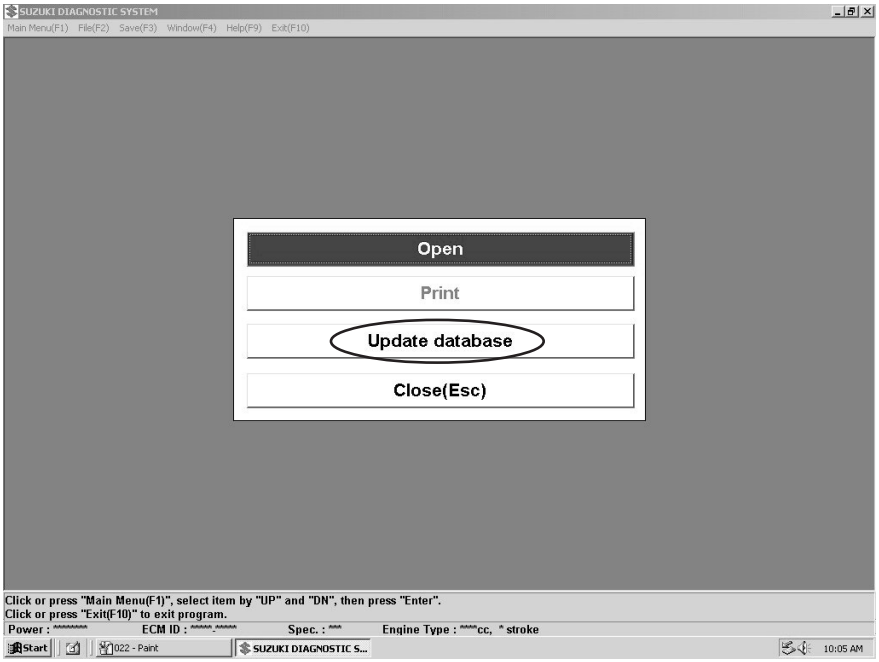


Fig.35

9. The DIRECTORY SELECTION dialog box (file location) in Fig.36 appears.
   In this dialog box, select a file necessary for database update.
   In the following case, the database file to be updated is in the CD-ROM drive (“d” drive) into which the SDS database disk (compact disk) was inserted.

NOTE:
Depending on the PC to be used, the driver letter of the CD-ROM drive may be “e”, “f”, or “q”. (Fig.36)
Refer to the manual of your PC.
To cancel database update, click the “Cancel” button.

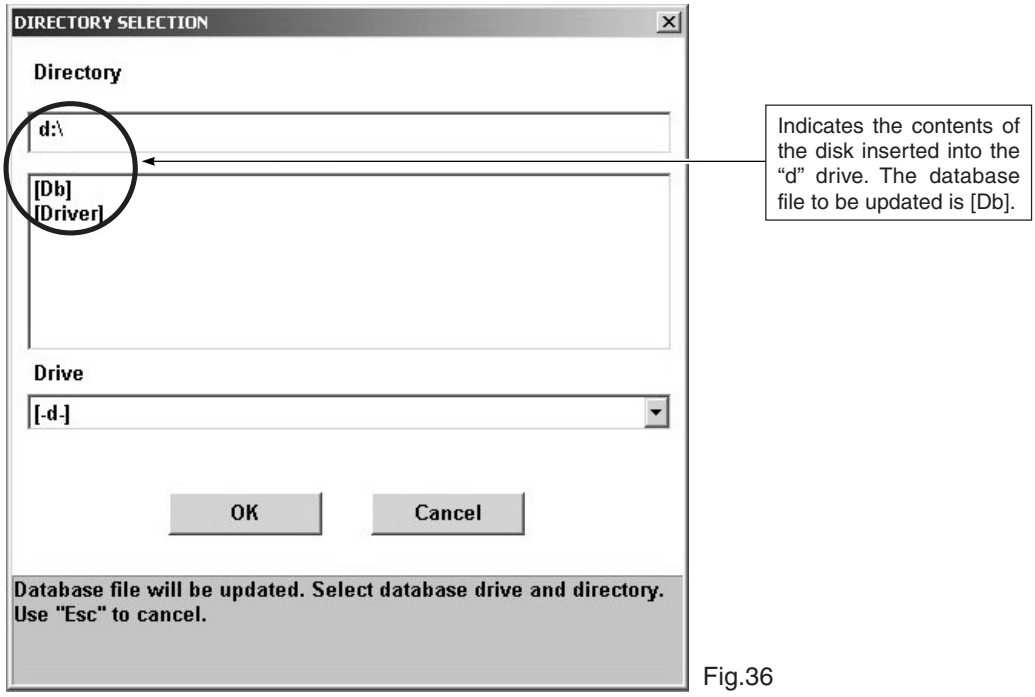


Fig.36

10. Check that [Db] exists in the selected directory (file location) and then click the [OK] button. (Fig.36-2)

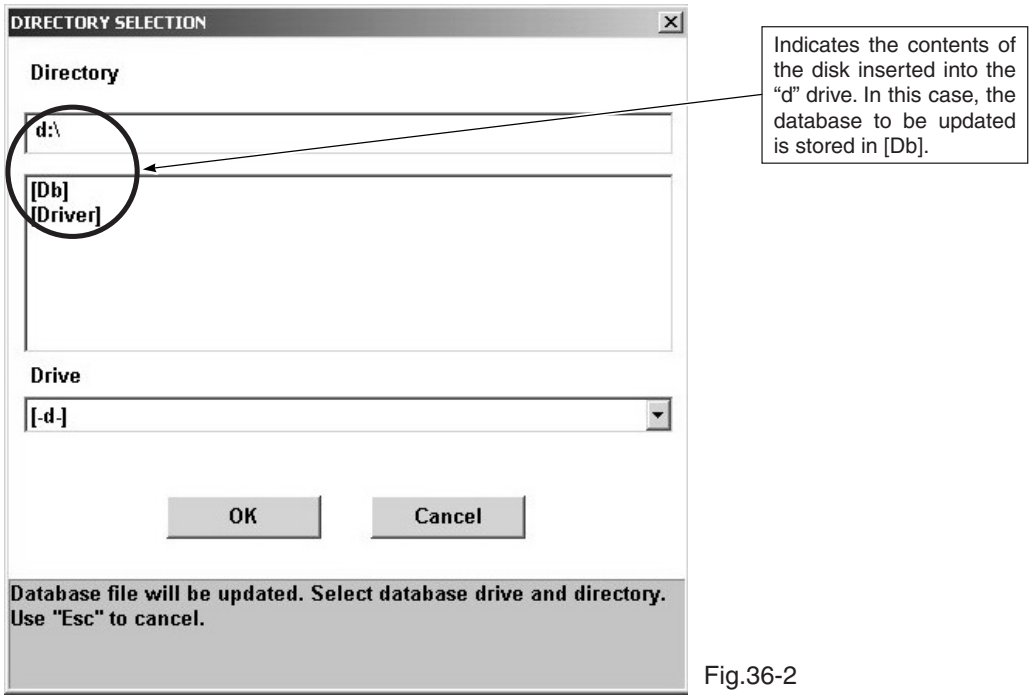


Fig.36-2

11. When the database has been successfully updated, the COMPLETED UPDATE dialog box (Fig.37) appears.

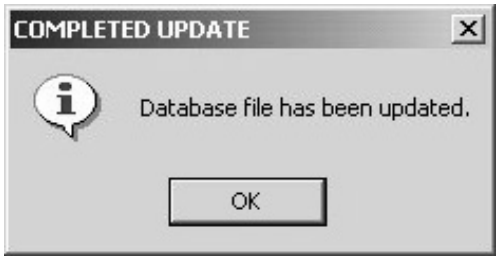


Fig.37

NOTE:
If you select a directory (file location) where the database file does not exist, a database update error message appears. (Fig.38)
Click the [OK] button and restart database update from Step 8.

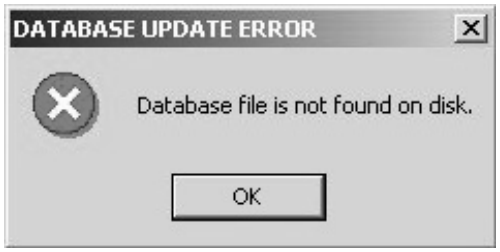


Fig.38

4. OPERATING SDS
4-1. CONNECTION AND STARTING THE SDS PROGRAM

NOTE:
- *Make sure that your PC is off before connecting the diagnostic harness.*
- *Make sure that the battery connected to the outboard motor is properly (fully) charged.*

1. Connect the diagnostic harness and USB cable (with a USB adapter) to the USB port of your PC and communication connector (4-pin connector). (Fig.39)

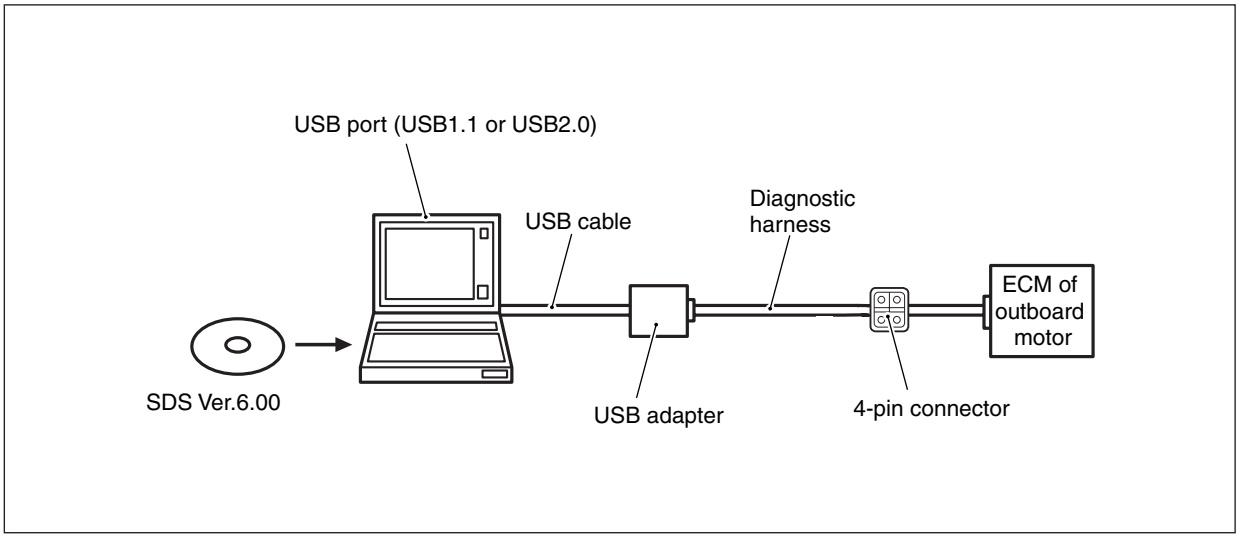


Fig.39

2. Turn on the main switch of the outboard motor.
3. Turn on your PC to start Windows.
4. From the task bar of the computer window, click the “Start” button and point to “Programs.”
5. To start the SDS program, click “SUZUKI DIAGNOSTIC SYSTEM”. (Fig.40)
   The SDS program will start. (Fig.41)

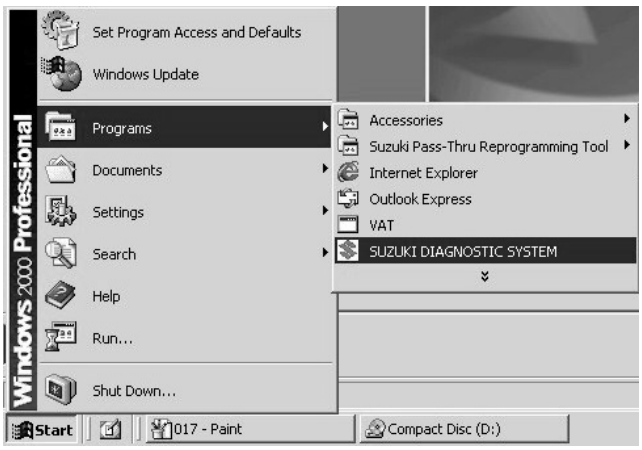


Fig.40

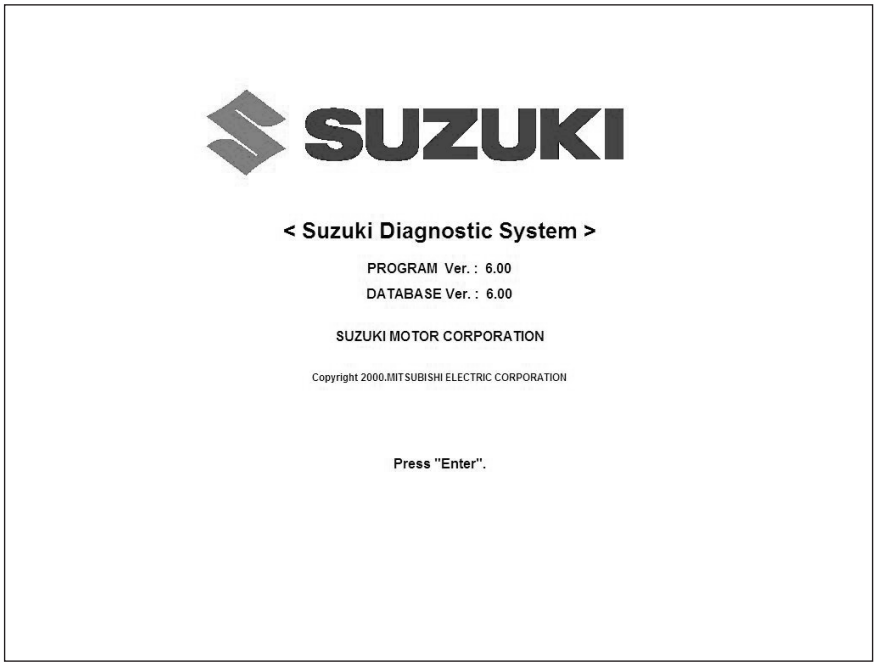


Fig.41

6. To proceed to the next window, press the “Enter” key. The “IMPORTANT NOTICE” window (Fig.42) appears.
   Read the messages in this window and follow the instructions.

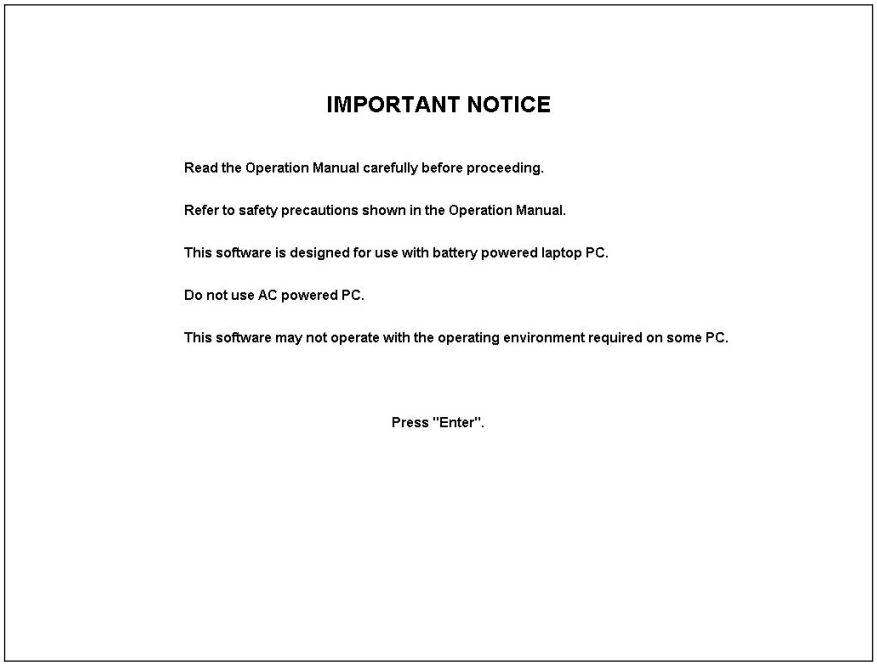


Fig.42

7. To proceed to the next window, press the “Enter” key. The “GENERAL INSTRUCTION” window (Fig.43) appears.
   Read the messages on this window and follow the instructions.
   Then press the “Enter” key.

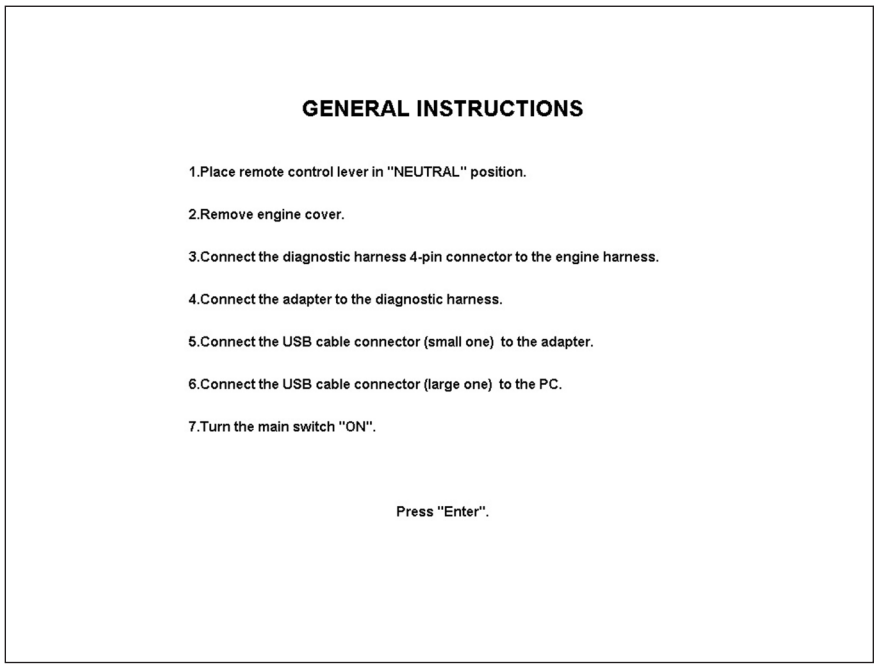


Fig.43

8. The first menu window (Fig.44) appears.

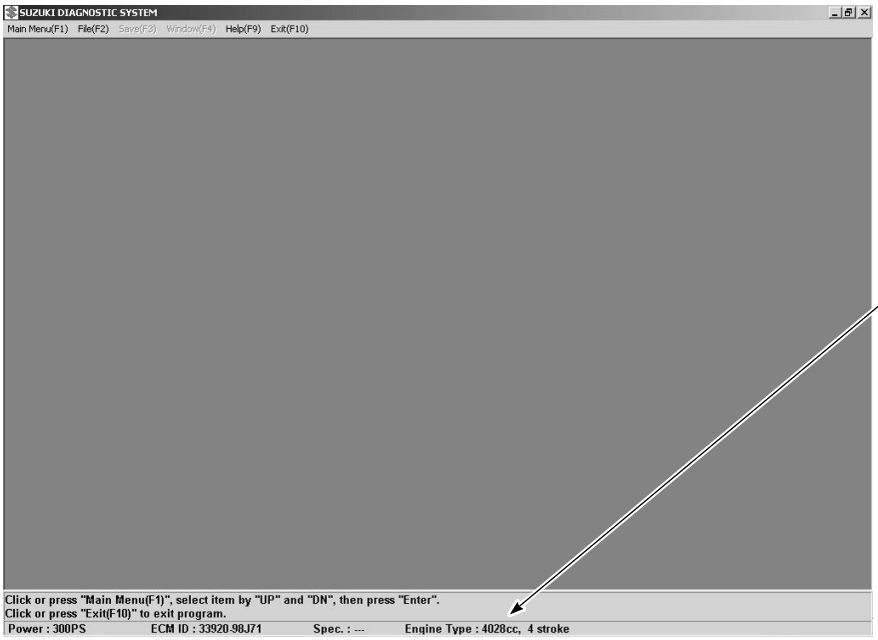


Fig.44

NOTE:

- *The first menu window appears after the ECM or BCM is automatically recognized.*
  When SDS is connected to the ECM, the ECM main window appears. When SDS is connected to the BCM, the BCM main window appears.
- *Clicking "Main Menu(F1)" when you change the connection from the ECM to BCM or vice versa after you turned off the main switch of the outboard motor with the SDS program started displays the following message. (Fig.45)*

Fig.45

NOTE:

If there is no reply from the ECM or BCM the following dialog box (Fig.46) appears. Read the messages in this dialog box, follow the instructions, and then click the "Reset" button to communicate again with the ECM or BCM.

(Keyboard) Select the "Reset" button by using the "Up" or "Down" arrow key and then press the "Enter" key.

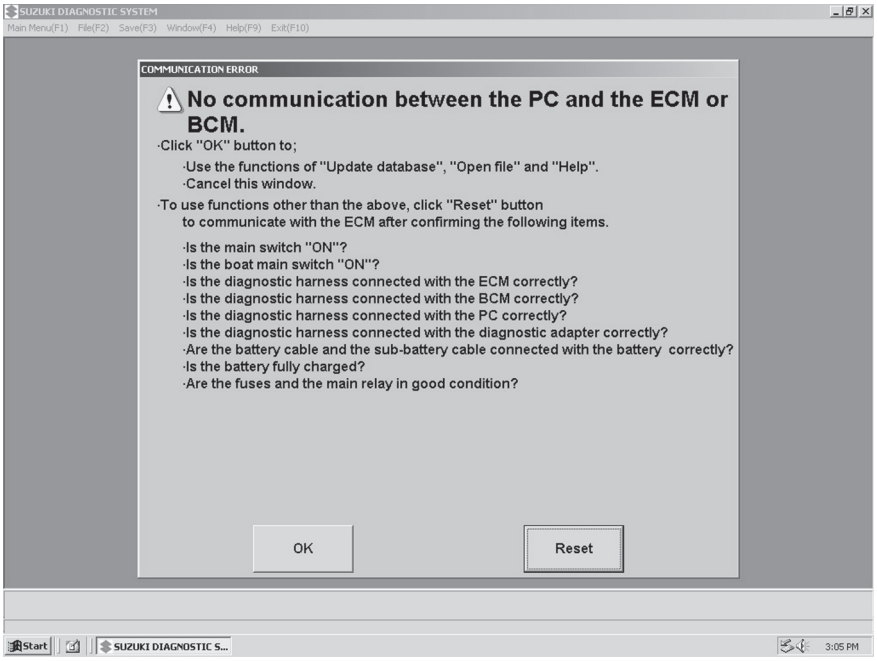


Fig.46

NOTE:

If the ECM or BCM makes no reply after the first menu window (Fig.44) has appeared once, the following dialog box (Fig.47) appears.

Read the messages in this dialog box, follow the instructions, and then click the "OK" button to communicate with the ECM or BCM.

(Keyboard) Press the "Enter" key.

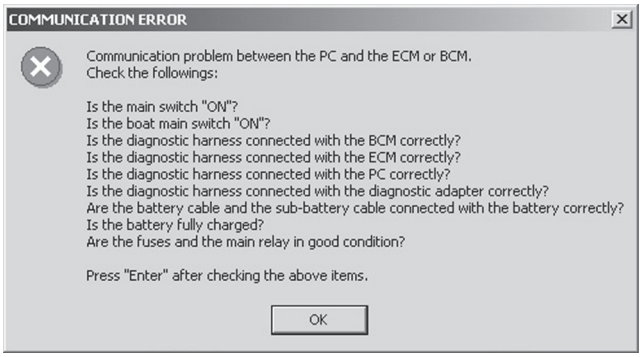


Fig.47

4-2. ECM MAIN MENU

1. From the first menu window (Fig.44), click “Main Menu(F1)” or press the “F1” key from the keyboard. The following main menu dialog box (Fig.48) appears.

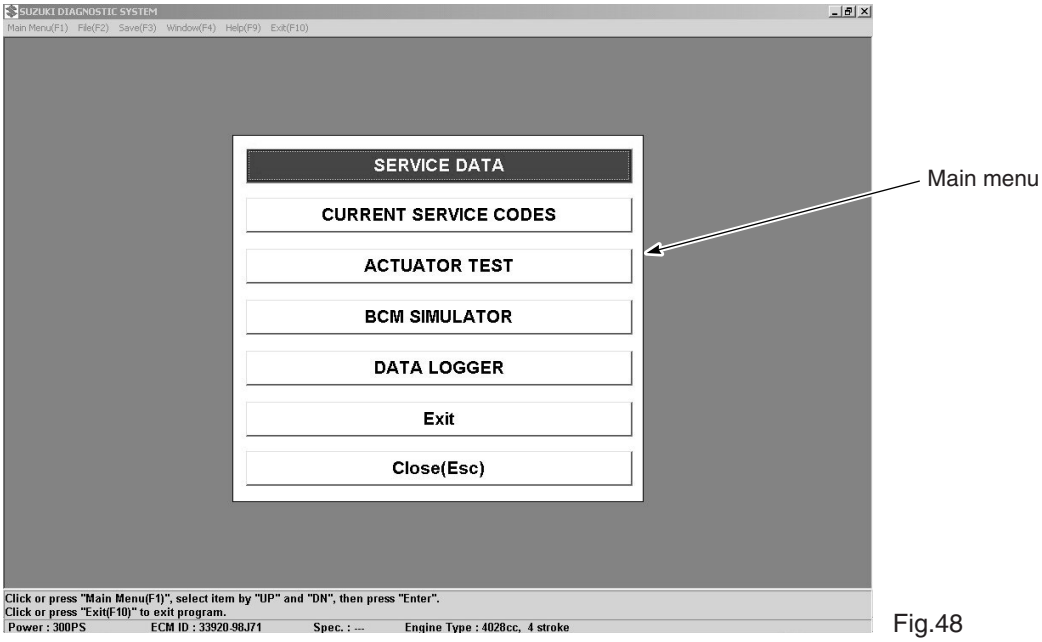


Fig.48

SERVICE DATA

Enables you to monitor real-time data related to the engine control system.
The monitored service data can be selected at will and can be saved as “csv” file format.

CURRENT SERVICE CODES

Enables you to display self-diagnosis code (current failure location name).

ACTUATOR TEST

Enables you to start and stop the actuator by using the monitored real-time data.
Also O_2 feedback operation can be performed.

BCM SIMULATOR (dedicated for DF300)

Enables you to control engine start/stop, gear settings (Forward, Neutral, Reverse), and throttle opening (from idling engine speed to max. 2 500 r/min) in place of the BCM. This simulator is used when the engine is operated in a test tank without a remote control box connected.

DATA LOGGER

Enables you to display major service data in a graph form.
A maximum of three items can be logged at one time and can be saved as “csv” file format.

Exit

Exits the SDS program.

Close (Esc)

Closes the menu box.

NOTE:

You can display the SERVICE DATA, CURRENT SERVICE CODES, and ACTUATOR TEST windows at the same time. To change the active window, click the “Window(F4)” button or press the “F4” key.

4-3. SERVICE DATA

1. Clicking the “SERVICE DATA” button from the main menu dialog box (Fig.48) displays the following “SERVICE DATA” window. (Fig.49) This window displays real-time engine data.

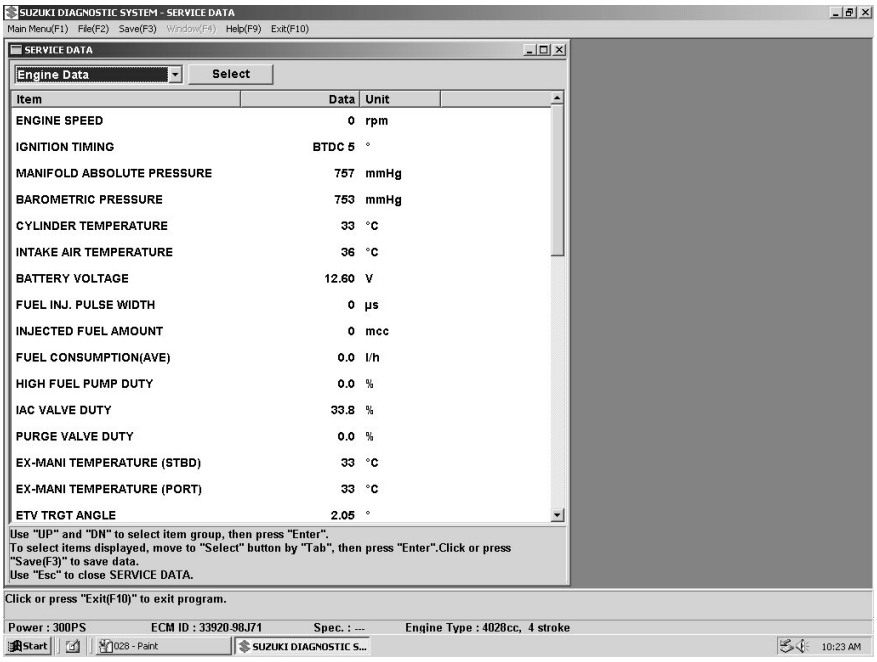


Fig.49

2. In the “SERVICE DATA” window, you can select one of the five data item groups (Engine Data, Caution Sys.info, Operation Hours, O_2 Feedback info, and All Service Data). (Fig.50)
   Select a data item group you want to use by clicking the ▼ button.
   (Keyboard) To select a data item group from the keyboard, select a menu by using the “Up” or “Down” key and then press the “Enter” key.

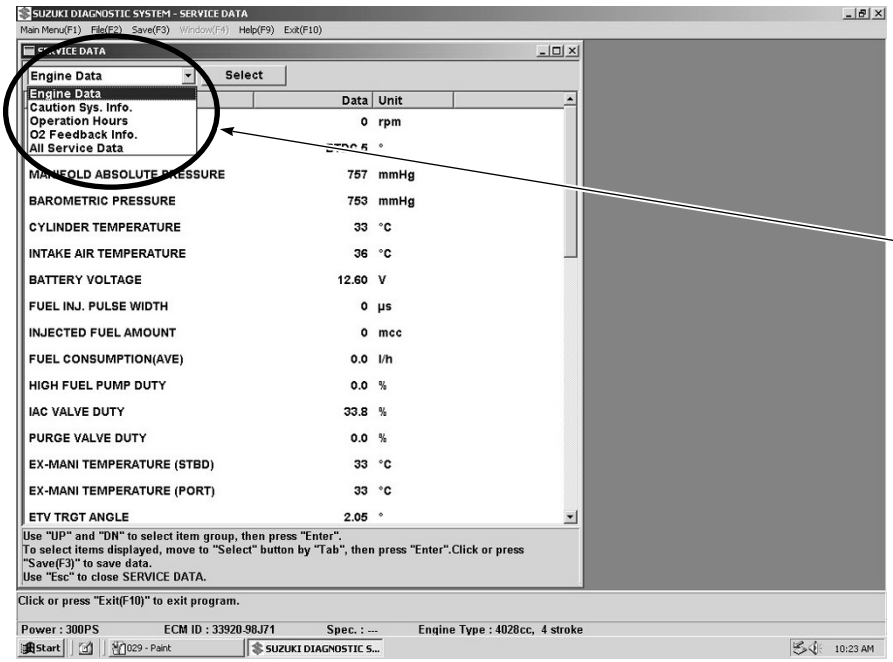


Fig.50

NOTE:
To check the items you can select from these five data groups, refer to the data item group tables in Section 4-10, "DATA ITEM GROUPS" (Page 52) in this manual.

3. You can select whether to display or hide the windows of these five data groups. To select an item whose window you want to display, click the "Select" button.
   (Keyboard) Move to the "Select" button by using the "Tab" key and press the "Enter" key.
4. The ITEM SELECTION (Engine Data) dialog box (Fig.51) appears.
   Items are displayed when their check boxes are selected (check boxes with "√" mark). Items are not displayed when their check boxes are cleared (check boxes without "√" mark). You select whether to display or hide an item by clicking the check box.
   (Keyboard) To display or hide an item, select it by using the "Up" or "Down" arrow key and press the "Space" key. To have the selected item accepted, move to the "OK" button by using the "Tab" key and press the "Enter" key.

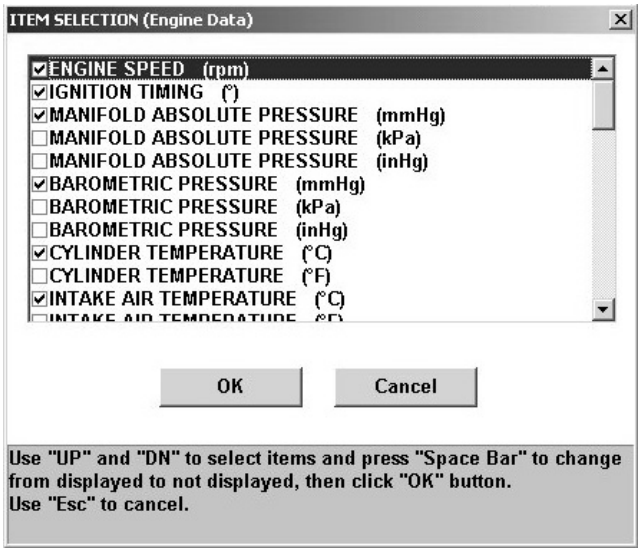


Fig.51

NOTE:
- *Clicking the "Cancel" button ignores the selected item and makes the previous selection valid.*
- *Pressing the "Esc" key ignores the selected item and makes the previous selection valid.*

SAVING SERVICE DATA

You can save all the displayed service data.

1. In the "SERVICE DATA" window (Fig.49), click the "Save(F3)" button ("F3" key on the keyboard). The COMMENT INPUT (SERVICE DATA) dialog box (Fig.52) appears. From this dialog box, type a comment into the Engine No., Boat Type, and Description fields and then click the "OK" button.
   (Keyboard) Move the cursor to the field in which to type a comment by using the "Tab" key. After typing the comment, move to the "OK" button by using the "Tab" key and press the "Enter" key to have the comment accepted.

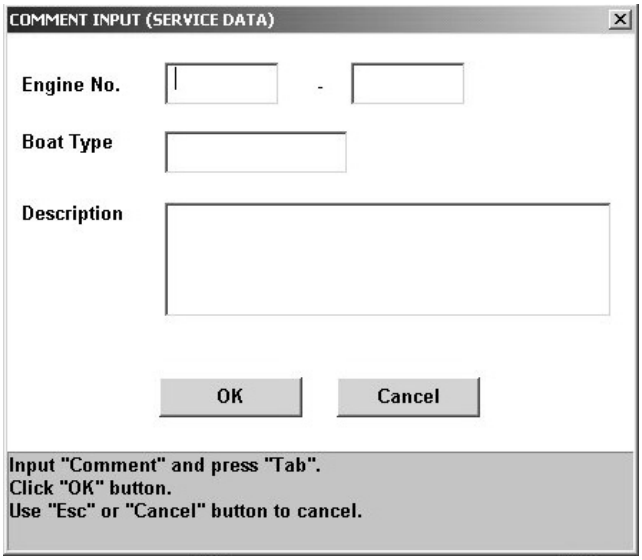


Fig.52

2. The “Save As” dialog box (Fig.53) appears.
   The file save destination (“DataList” folder) is automatically selected and the file name is also automatically displayed.

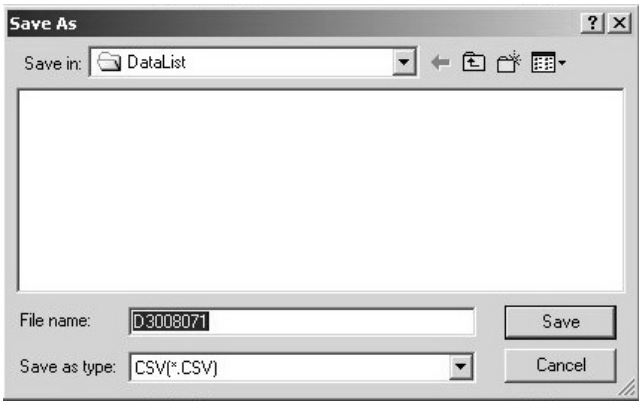


Fig.53

Default (initial) save destination directory
Windows 2000/XP
C:\Documents and Settings\All Users\Documents\SDS\DataList\Dxxxxxxx.csv
Windows Vista
C:\Users\Public\Documents\SDS\DataList\Dxxxxxxx.csv

NOTE:
You can change the file name and file save destination as required.

D X X X X X X X
① ② ③ ④

① Engine type	Example: D3007251
② Month (1.2.3.4.5.6.7.8.9.X.Y.Z)	300 horsepower
③ Date (01 – 31)	July 25
④ Number (1 – 9, A – Z)	First file recorded on the above date

3. Click the “Save” button to save data.
   To cancel data save, click the “Cancel” button.
   (Keyboard) Move to the “Save” button and press the “Enter” key to have the saved data accepted or move to the “Cancel” button and press the “Enter” key to cancel the selected data.

NOTE:
When opening the saved service data, refer to “OPENING SAVED DATA” (Page 31) in this manual.
Service data is saved when you click the “Save(F3)” button (“F3” key on the keyboard).

OPENING SAVED DATA

1. In the Initial Menu window (Fig.44), click the “File(F2)” button (“F2” key on the keyboard).
   The following File Menu dialog box (Fig.54) appears. Click the “Open” button.
   (Keyboard) Move to the “Open” button by using the “Up” or “Down” arrow key and press the “Enter” key to have the button accepted.

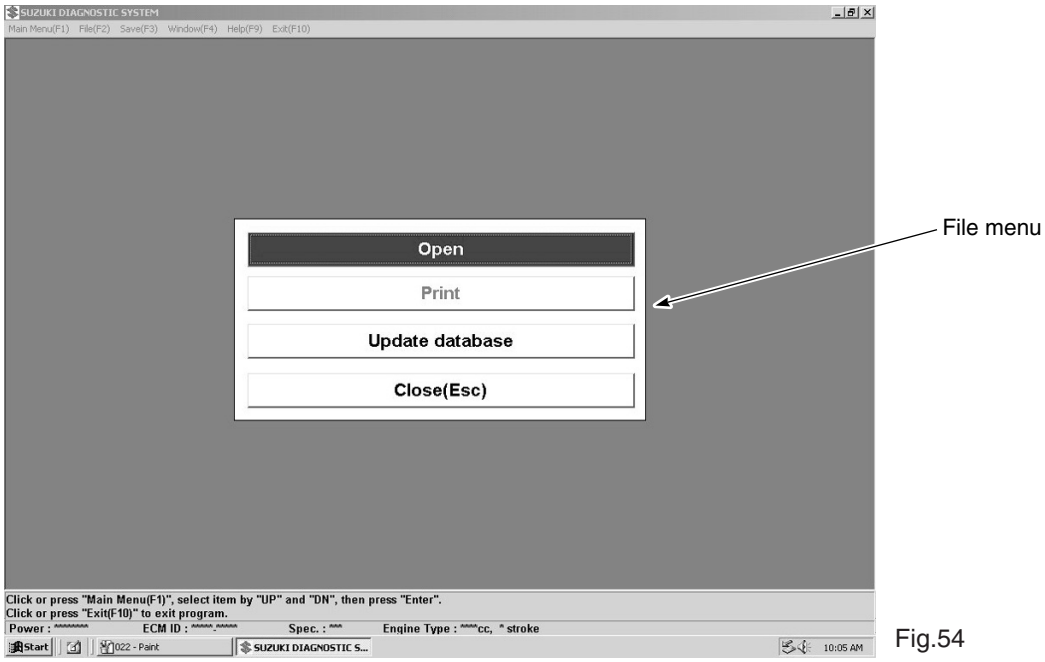


Fig.54

2. The “Open” dialog box (Fig.55) appears.
   Select a desired file and click the “Open” button.
   (Keyboard) To change the selected button to another button, use the “Tab” key. Select a desired file by using the “Up” or Down” arrow key and press the “Enter” key to have the file accepted.

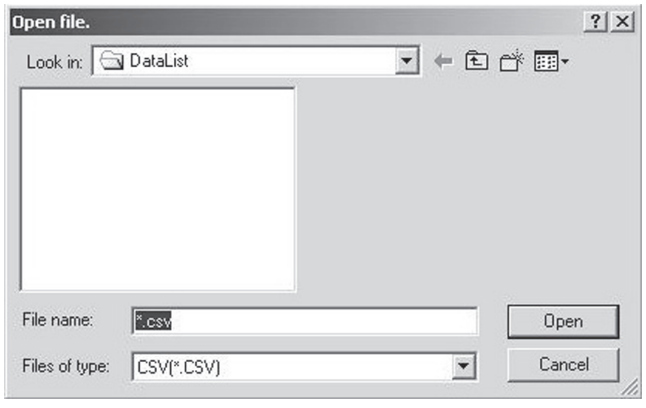


Fig.55

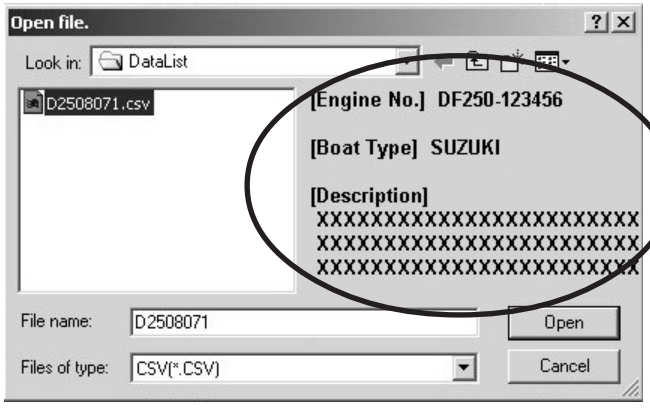


Fig.55-2

NOTE:

- *Entering comments from the Engine No., Boat Type, and Description fields and selecting the file to be saved displays the information in the subwindow. (Fig.55-2)*
- *Service data is saved to the “DataList” folder and logging data to the “DataGraph” folder.*

4-4. ECM CURRENT SERVICE CODES

1. Clicking the “CURRENT SERVICE CODES” button from the Main Menu dialog box (Fig.48) displays the following CURRENT SERVICE CODES window. (Fig.56)
   This window shows failed item names and actions to be taken.

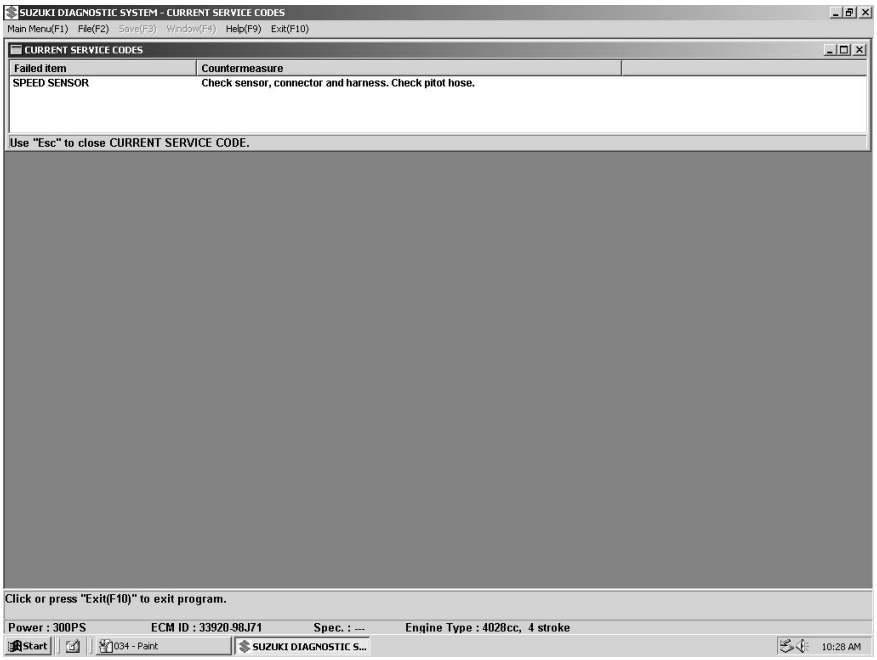


Fig.56

NOTE:

- *If there is no failed item (no current service code), “NO failure” is displayed in the CURRENT SERVICE CODES window.*
- *You can simultaneously display the SERVICE DATA, CURRENT SERVICE CODES, and ACTUATOR TEST windows.*
- *To change the active window, click the “Window(F4)” button (“F4” key on the keyboard).*

4-5. ACTUATOR TEST

1. Clicking the “ACTUATOR TEST” button from the Main Menu dialog box (Fig.48) simultaneously displays the following two windows. (Fig.57)

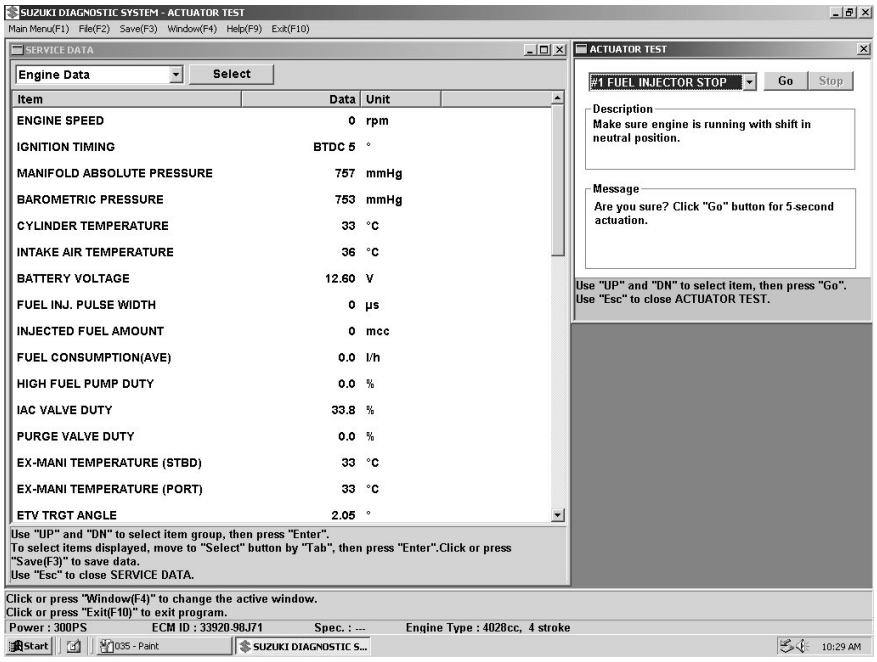


Fig.57

NOTE:

- *Opening the ACTUATOR TEST window automatically opens the SERVICE DATA (Engine Data) window.*
- *Read “Description” and “Message” in the ACTUATOR TEST window and follow the instructions.*
- *To change the active window, click the “Window(F4)” button (“F4” key on the keyboard).*

2. In the ACTUATOR TEST window, click the ▼ button to select an actuator test item. (Fig.58)
   (Keyboard) To select a displayed item, move to the “Select” button by using the “Tab” key, Select an item by using the “Up” or “Down” arrow key and press the “Enter” key to have the item accepted.

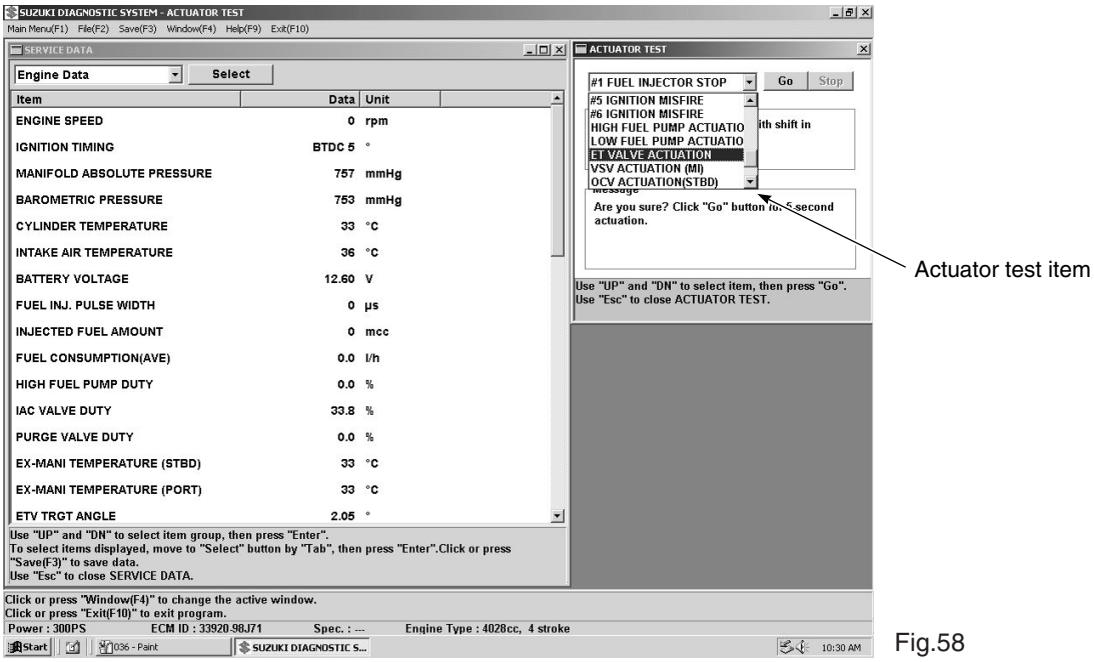


Fig.58

NOTE:
When selecting “O_2 Feedback”, refer to “Performing the O_2 Feedback” (Page 37).

3. To perform the selected actuator test, click the “Go” button.
   The test is performed for 5 seconds and then stops automatically.
   (Keyboard) Move to the “Go” button by using the “Tab” key and then press the “Enter” key.

NOTE:
- *[Fixed Ignition Timing] continues till the “Stop” button is pressed.*
- *Clicking the “Stop” button when the test is being performed interrupts the test.*
- *If no response is made from the ECM during the interruption, the following dialog box (Fig.59) appears.*
  Turn off the engine key once and then restart the SDS program.

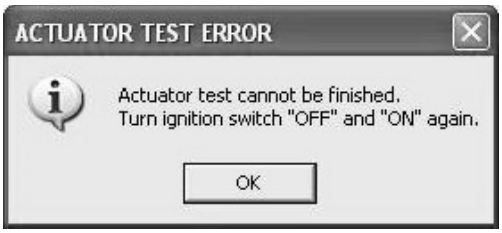


Fig.59

EXPLANATION OF ACTUATOR TEST ITEMS

#X FUEL INJECTOR STOP (DF40 to DF300):
Fuel injection for the specified cylinder will stop for 5 seconds. This test can be performed when the engine is running.

#X FUEL INJECTOR ACTUATION (DF40 to DF300):
Fuel injection for the specified cylinder will be actuated for 5 seconds. This test can be performed when the engine is not running.

#X IGNITION MISFIRE (DF40 to DF300):
Ignition for the specified cylinder will stop for 5 seconds. This test can be performed when the engine is running.

FIXED IGNITION TIMING (DF40 to DF300):
Ignition timing will be fixed at BTDC 5° till the "Stop" button is clicked. This test can be performed when the engine is running.
This test can be used for ignition system troubleshooting during engine idling.
The monitored ignition timing during actuation is a calculated value, not an actual value.

O_2 FEEDBACK (DF40 to DF250, 2007 year model and early):
The O_2 feedback operation can be performed. Refer to "Performing the O_2 Feedback" (Page 37) in this manual.

HIGH-PRESSURE FUEL PUMP ACTUATION (DF40 to DF300):
The high-pressure fuel pump will be actuated at 100% duty for 5 seconds. This test can be performed when the engine is not running.

LOW-PRESSURE FUEL PUMP ACTUATION (DF200 to DF300):
The low-pressure fuel pump will be actuated at 100% duty for 5 seconds. This test can be performed when the engine is not running.

IAC ACTUATION
(DF40 to DF140):
The IAC valve will be actuated at 1 Hz (once in one minute) for 5 seconds. This test can be performed when the engine is not running.
(DF70A/80A/90A, 2009 year model/DF150 – DF250):
The IAC valve will be actuated so that the target engine speed becomes 1 000 r/min. This test can be performed when the engine is running and the fully close throttle signal of throttle position sensor to be input to ECM.

ETV ACTUATION (DF300):
The ETV valve will be actuated so that the target engine speed becomes 1 000 r/min. This test can be performed when the engine is running and the fully close throttle signal of throttle position sensor to be input to ECM.

VSV ACTUATION (VARIABLE INDUCTION MODELS DF150/DF175/DF225/DF250):
The vacuum switching valve will be actuated at 50% duty for 5 seconds. This test can be performed when the engine is not running.

OCV (STBD) ACTUATION (DF250/DF300):
The oil control valve (STBD) will be actuated for 5 seconds. This test can be performed when the engine is not running.
OCV (PORT) ACTUATION (DF250/DF300):
The oil control valve (PORT) will be actuated for 5 seconds. This test can be performed when the engine is not running.

OCV ACTUATION (DF175):
The oil control valve will be actuated for 5 seconds. This test can be performed when the engine is not running.

PURGE VALVE ACTUATION (DF200 to DF300):
The purge valve will be actuated at 50% duty. This test can be performed when the engine is not running.

VVT ACTUATOR (DF175/DF250/DF300):
The actuator will be actuated so that the advance quantity becomes 10°. This test can be performed when the engine is running (2 000 engine speed or faster).

PERFORMING THE O_2 FEEDBACK (DF40 to DF250, 2007 year model and early)

After extended usage, the engine components may become deteriorated or worn out. This might make the air/fuel mixture raito incorrect which could affect the exhaust emission of the engine. To correct the air/fuel mixture raito, the O_2 sensor should be used to measure oxygen in the exhaust gas.
The ECM uses the O_2 sensor data to correct the compensation coefficient of the fuel injection duration map.

PROCEDURE

1. Install the O_2 sensor and protector tube on the outboard motor.
   Connect the O_2 sensor connector to the conversion adapter, then connect the diagnostic harness (with the adapter) to the communication connector of the outboard motor. Fit the test wheel.

TOOL
09933-19840: Diagnostic harness
09933-19830: USB adapter
09933-19880: Conversion adapter
18213-74F00: O_2 sensor
18498-90J20: Protector tube
09914-79511: Test wheel (for DF60/DF70)
09914-79410: Test wheel (for DF40/DF50)
09914-79010: Test wheel (for DF90/DF115/DF140)

NOTE:
- *Refer to "Periodic Maintenance/FUEL MIXTURE CHECK" section in the Service Manual of the associated outboard motor.*
- *DF70A/80A/90A/DF300 does not have the O_2 feedback function.*

2. Start the engine and warm it up for at least 5 minutes at around 2 000 r/min.
3. Select "O_2 FEEDBACK" by clicking the ▼ button of the Actuator Test text box. (Fig.58)
   The Service Data window (O_2 feedback information) automatically appears. Confirm that "STAND-BY" is displayed to the right of O_2 FEEDBACK in the lower part of the item box. (Fig.60)

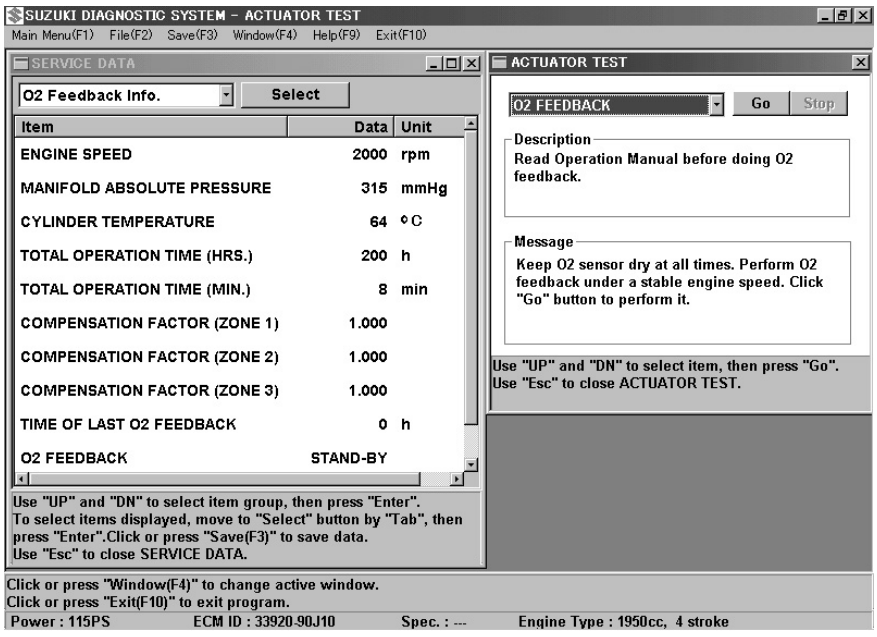


Fig.60

NOTE:
O_2 feedback requires that the following five items are displayed in the item box of the Service Data window (O_2 feedback information).
Select a display item by using the "Select" button as required.
- *ENGINE SPEED*
- *COMPENSATION FACTOR (ZONE 1)*
- *COMPENSATION FACTOR (ZONE 2)*
- *COMPENSATION FACTOR (ZONE 3)*
- *O_2 FEEDBACK ("STAND-BY", "ACTION", "FIN.OK", or "FIN.NG" is displayed in the "Data" column)*

4. Shift into forward gear.

NOTE:
The O_2 feedback operation should be performed under engine load. Do not perform the O_2 feedback operation using the warm-up lever (or throttle control grip) without first shifting into forward gear.

5. Adjust the engine speed to "ZONE 1" and click the "Go" button. (Fig.61)
   Retain the specified engine speed for at least 20 seconds.
   - If the buzzer sounds for about 2 seconds (1 beep only), feedback at this zone finished successfully. The "Compensation Factor" data in the Service Data (O_2 feedback information) will also be changed.
     Go to the next step.
   - If the buzzer does not sound within 2 minutes, feedback at this zone is unsuccessful. Ignore this zone and go to the next step.
   - If the buzzer sounds with a series of long (about 2 seconds) beep and "FIN.NG" appears in the Service Data (O_2 feedback information), feedback at this zone is unsuccessful (Fig.63). Click the "Stop" button to return to "STAND-BY" mode.

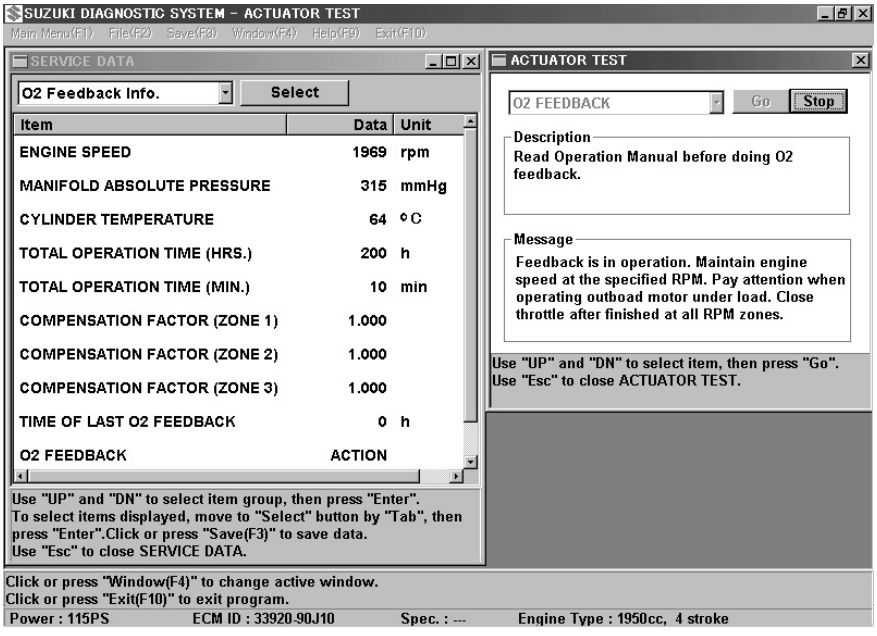


Fig.61

NOTE:

- *Do not close the throttle fully for more than 10 seconds while the feedback operation is being performed. This will cause the O_2 feedback operation to finish with incomplete data.*
- *Do not allow the engine to be stable at an unnecessary speed range (other than the zone r/min) for more than 10 seconds. Thie will cause the O_2 feedback operation to be done with an incorrect data for that speed range.*
- *As the zirconia element in the O_2 sensor is not conductive below 250 °C, the O_2 sensor will not function properly until the engine is at normal operating temperature.*

Zone r/min chart

	DF40/50	DF60/70	DF90/115/140	DF150/175	DF200/225/250
ZONE 1	2 500 ± 100 r/min	2 000 ± 100 r/min	3 000 ± 100 r/min	3 000 ± 100 r/min	3 000 ± 100 r/min
ZONE 2	3 500 ± 100 r/min	3 000 ± 100 r/min	4 000 ± 100 r/min	4 000 ± 100 r/min	4 000 ± 100 r/min
ZONE 3	4 500 ± 100 r/min	4 000 ± 100 r/min	5 000 ± 100 r/min	5 000 ± 100 r/min	5 000 ± 100 r/min

6. Repeat Step 5 at r/min of ZONE 2.
7. Repeat Step 5 at r/min of ZONE 3.
8. If there is a zone at which feedback failed, rerun feedback at that zone.
9. When O_2 feedback at all zones has successfully finished, return the throttle to the fully closed position.
10. After about 10 seconds the throttle is set to the fully closed position, the buzzer sounds as follows:
    - When feedback finishes normally, the buzzer sounds for about 0.5 second (1 beep only). “FIN.OK” is also displayed. (Fig.62)
    - When feedback does not normally finish, the buzzer sounds with a series of long (2 seconds) beep. “FIN.NG.” is also displayed. (Fig.63)

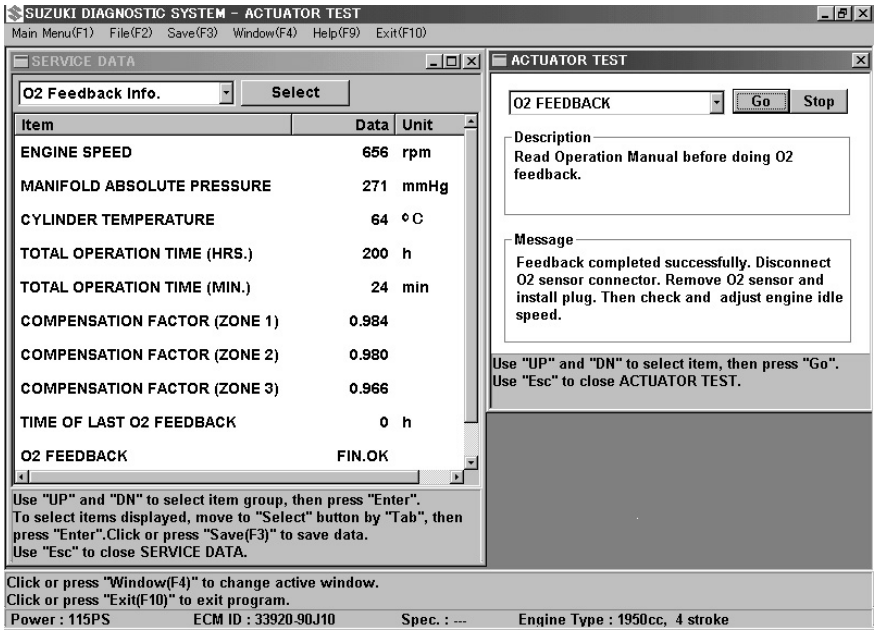


Fig.62

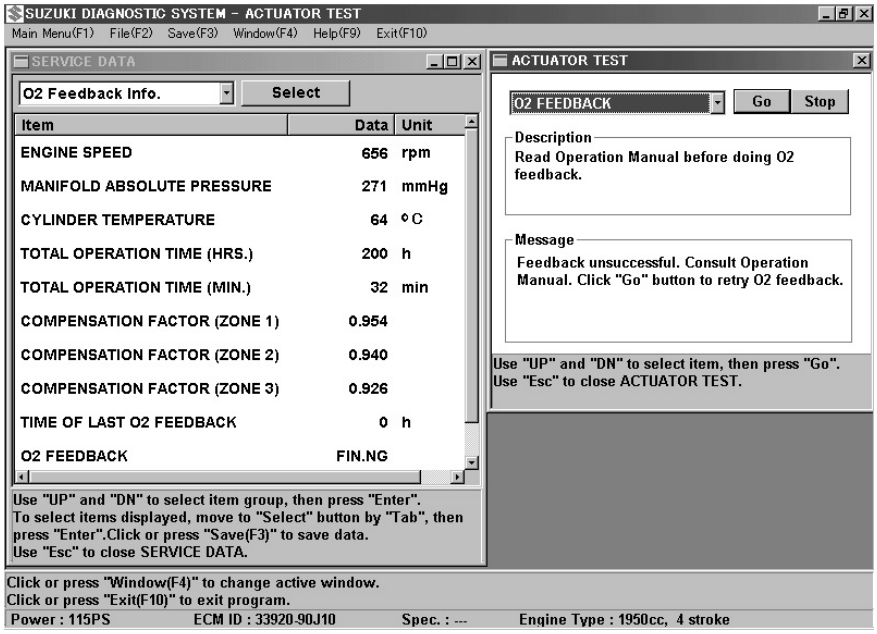


Fig.63

11. If retrying feedback operation, repeat procedure used in the Step 5 to 10.
12. Click the “Stop” button before closing the ACTUATOR TEST (O_2 FEEDBACK) window.

NOTE:

Repeat the O_2 feedback operation with a new O_2 sensor if.

- *The total feedback operation finishes without returning he throttle to a full closed position.*
- *The total feedback operation failed repeatedly.*

4-6. BCM SIMULATOR (DEDICATED FOR DF300)

1. Clicking the “BCM SIMULATOR” button from the Main Menu dialog box (Fig.48) displays the following NOTICE window. Click the “OK” button to proceed to the next step. (Fig.64)

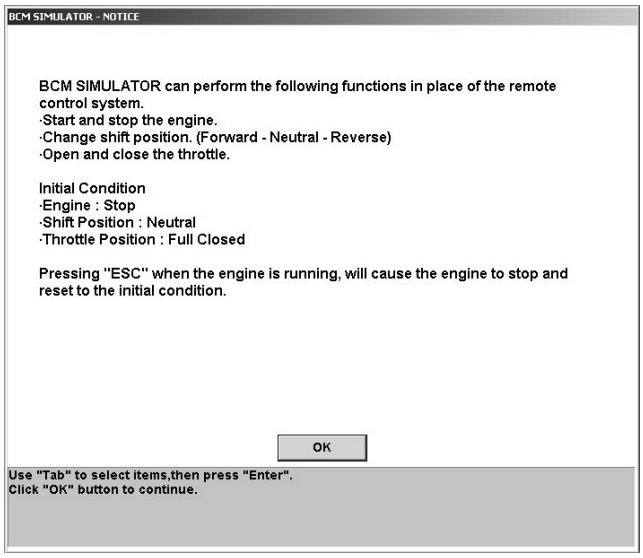
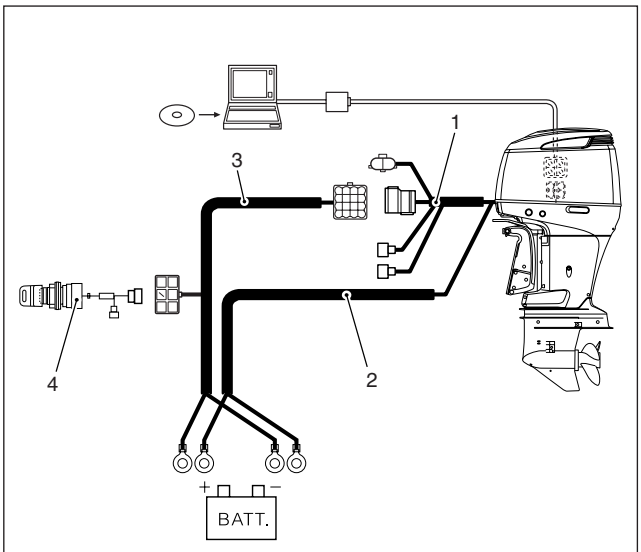


Fig.64



1. Engine main harness
2. Battery cable
3. BCM simulator harness (09930-89860)
4. Main switch (37110-98J00)

NOTE:
Before commencing simulation, connect special tools as shown in the right.

2. The following window (Fig.65) appears.

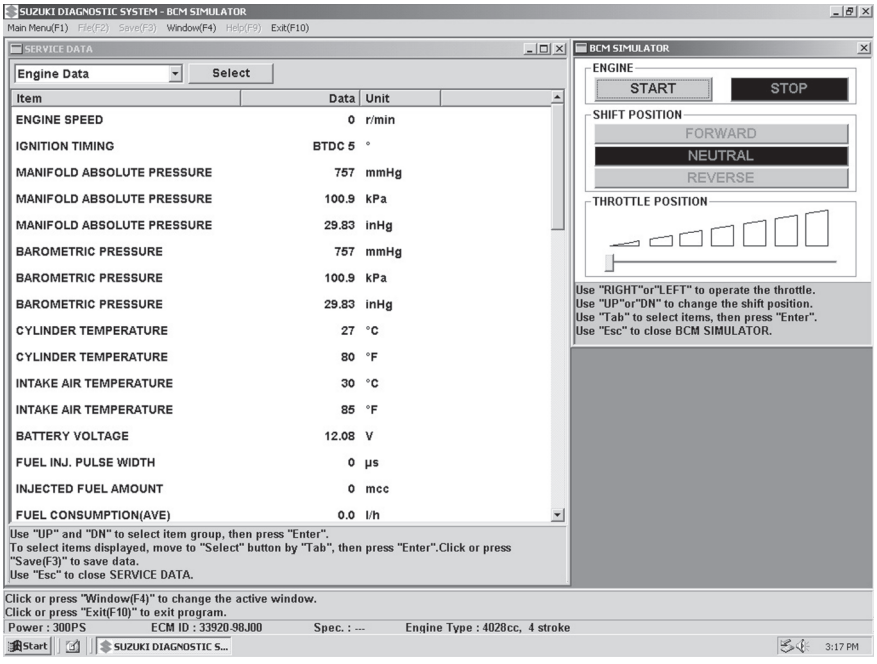


Fig.65

NOTE:

- *Opening the BCM SIMULATOR window automatically opens the SERVICE DATA (Engine Data) window.*
- *Read "Description" and "Message" in the BCM SIMULATOR-NOTICE window and follow the instructions.*
- *To change the active window, click the "Window(F4)" button ("F4" key on the keyboard).*

3. In the BCM SIMULATOR window, check that "Neutral" is selected in the SHIFT POSITION and the slide bar in the throttle opening is set to the minimum position. (Fig.66)
4. Clicking the "START" button in the Engine menu of the BCM SIMULATOR window starts the engine.
   (Keyboard) Move to the "START" button by using the "Tab" key and press the "Enter" key.
5. In the SHIFT POSITION menu, click the "FORWARD", "NEUTRAL", or "REVERSE" button as required to switch shift operation.
   You can adjust the engine speed by dragging the slide bar in the Throttle position menu.
   (Keyboard) Move to an item you want to select by using the "Tab" key and press the "Enter" key. Operate the slide bar by using the "Left" or "Right" arrow key. Operate the shift position by using the "Up" or "Down" key.
6. To stop the engine, click the "STOP" button in the Engine menu or press the "Esc" key on the keyboard.
   (Keyboard) Move to the "STOP" button by using the "Tab" key and press the "Enter" key.

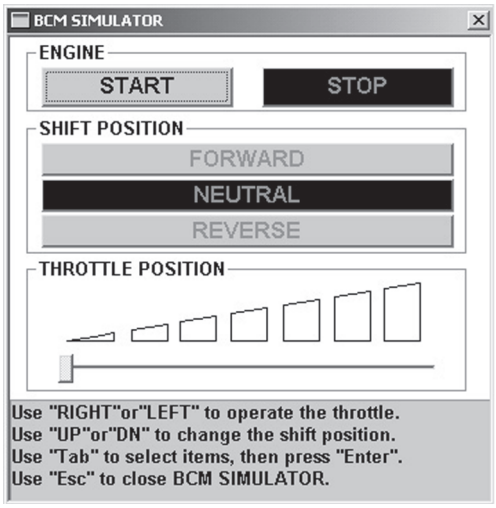


Fig.66

NOTE:

- *You can click the "START" button only when ""NEUTRAL" is selected in the SHIFT POSITION menu and the throttle opening is set to "Minimum".*
- *In the SHIFT POSITION menu, you can select "FORWARD" and "REVERSE" only when the throttle opening is set to "Minimum".*
- *When the throttle opening is "Maximum", the maximum engine speed is 2 500 r/min.*
- *If you stop the engine by clicking the "STOP" button or pressing the "Esc" key, the shift position and throttle opening automatically enter the initial status.*
  (Shift position: Neutral, throttle opening: Minimum)
- *"File (F2)", "Save (F3)" and "Help (F9)" keys are invalid when performing BCM simulator.*

4-7. DATA LOGGER

1. Clicking the “DATA LOGGER” button from the Main Menu dialog box (Fig.48) displays the following window (Fig.67). This window can display up to three primary service data in the graph form.
   To change or select a display item, click the “Setup” button.
   (Keyboard) To change the Monitor menu, select it by using the “Up” or “Down” arrow key and press the “Enter” key.

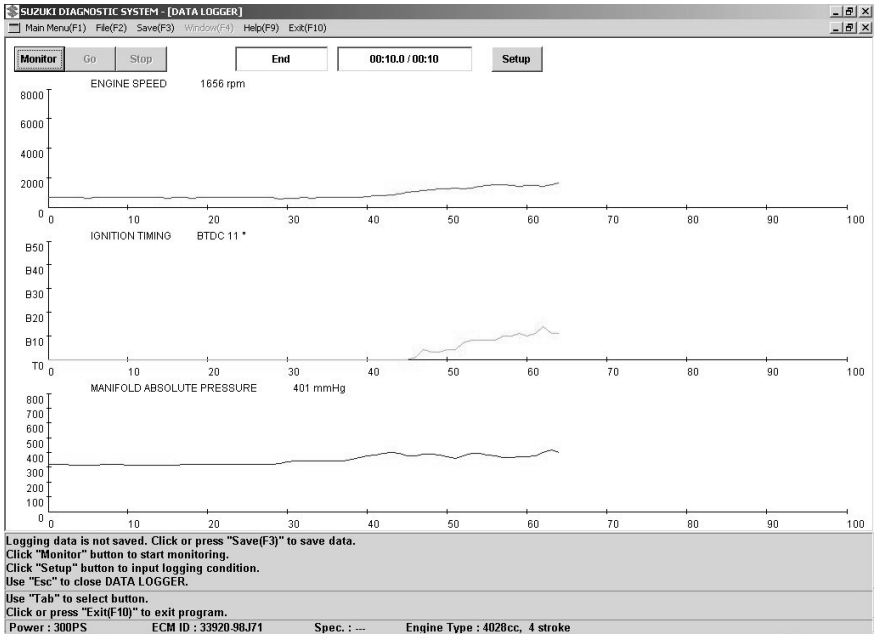


Fig.67

NOTE:
If you open the DATA LOGGER window when the SERVICE DATA, CURRENT SERVICE CODES, and ACTUATOR TEST windows are open, other windows are automatically closed and only the DATA LOGGER window is displayed.

2. Selecting the “Setup” button displays the LOGGING CONDITION SETUP dialog box. (Fig.68)
   In the Condition field, enter a sampling cycle and data logger time and select up to three display items.
   Items are displayed when their check boxes are selected (check boxes with “√” mark). Items are not displayed when their check boxes are cleared (check boxes without “√” mark). You select whether to display or hide an item by clicking the check box.
   (Keyboard) To display or hide an item, select it by using the “Up” or “Down” arrow key and press the “Space” key. To have the selected item accepted, move to the “OK” button by using the “Tab” key and press the “Enter” key.

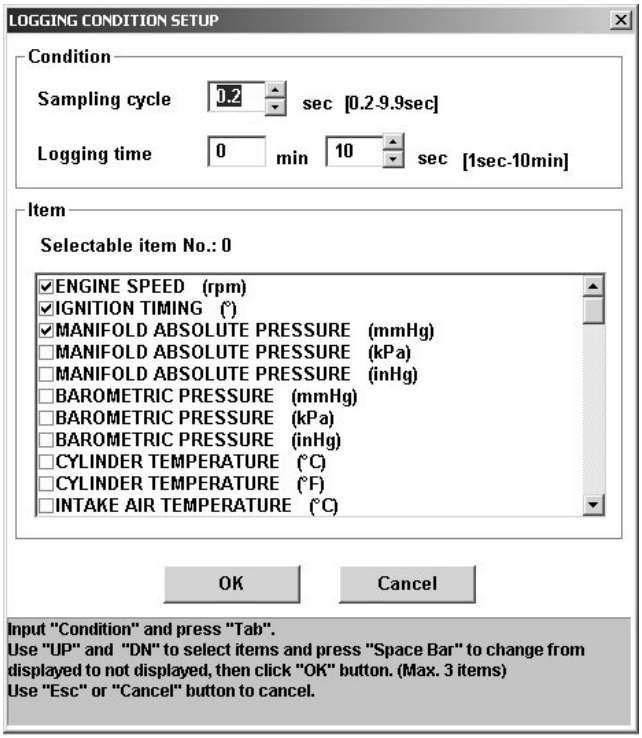


Fig.68

NOTE:
If the input status is incorrect or no item is selected, the INPUT ERROR dialog box (Fig.69) appears. Click the “OK” button and repeat Step 2.

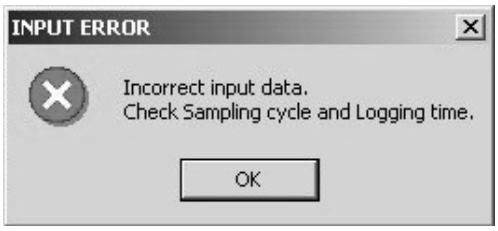


Fig.69

3. To monitor data, click the “Monitor” button. To stop monitoring, click the “Stop” button. (Fig.67)
   (Keyboard) Move to the “Monitor” button by using the “Tab” key and press the “Enter” key to have monitoring accepted.

NOTE:
- *The “Stop” button is available only when data is being monitored or logged.*
- *On the graphs for the following 33 items, the numbers on the vertical axis show the number of times counted after the current DATA LOGGER window has opened, not the total number of items. (The number of times is returned to zero (0) when logging or monitoring is started.)*
- *Refer to “DATA ITEM GROUPS” (page 52) of this manual for items which can be selected.*

- NO. OF CHECK CODE WIRE FAILURE
- NO. OF EX TEMP SNSR FAILURE (S)
- NO. OF EX TEMP SNSR FAILURE (P)
- NO. OF SP SENSOR FAILURE
- NO. OF TPS FAILURE
- NO. OF NEUTRAL SWITCH FAILURE
- NO. OF INTAKE FAILURE
- NO. OF MAP SENSOR FAILURE
- NO. OF CKP SENSOR FAILURE
- NO. OF CMP FAILURE (VVT_STBD)
- NO. OF CMP FAILURE (VVT_PORT)
- NO. OF VVT ADVANCE FAILURE (S)
- NO. OF VVT ADVANCE FAILURE (P)
- NO. OF OCV FAILURE (VVT_STBD)
- NO. OF OCV FAILURE (VVT_PORT)
- NO. OF IAC VALVE FAILURE
- NO. OF CMP SENSOR FAILURE
- NO. OF CYL. TEMP. SENSOR FAILURE
- NO. OF IAT SENSOR FAILURE
- NO. OF FUEL INJECTOR FAILURE
- NO. OF OVER REVOLUTION
- NO. OF LOW BATTERY VOLTAGE
- NO. OF LOW OIL PRESSURE
- NO. OF OVERHEAT (GRADIENT)
- NO. OF OVERHEAT (TEMP)
- NO. OF ETV FAILURE (ECM)
- NO. OF ETV FAILURE (MTR)
- NO. OF ETV FAILURE (MOV)
- NO. OF DBW SYSTEM FAILURE
- NO. OF ESA FAILURE (ECM)
- NO. OF ESA FAILURE (MTR)
- NO. OF ESA FAILURE (MOV)
- NO. OF TRIM SENSOR FAILURE

4. To start data logging, click the “Go” button. (Fig.70)
   Data logging automatically stops at the entered time. To stop data logging, click the “Stop” button. (Fig.71)
   (Keyboard) Move to the “Go” or “Stop” button by using the “Tab” key and press the “Enter” key to have it accepted.

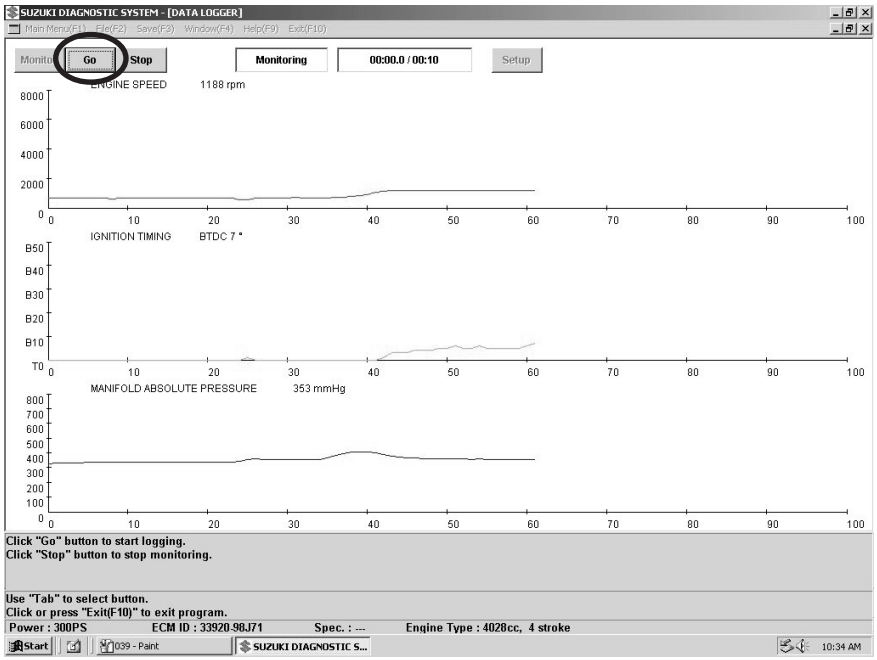


Fig.70

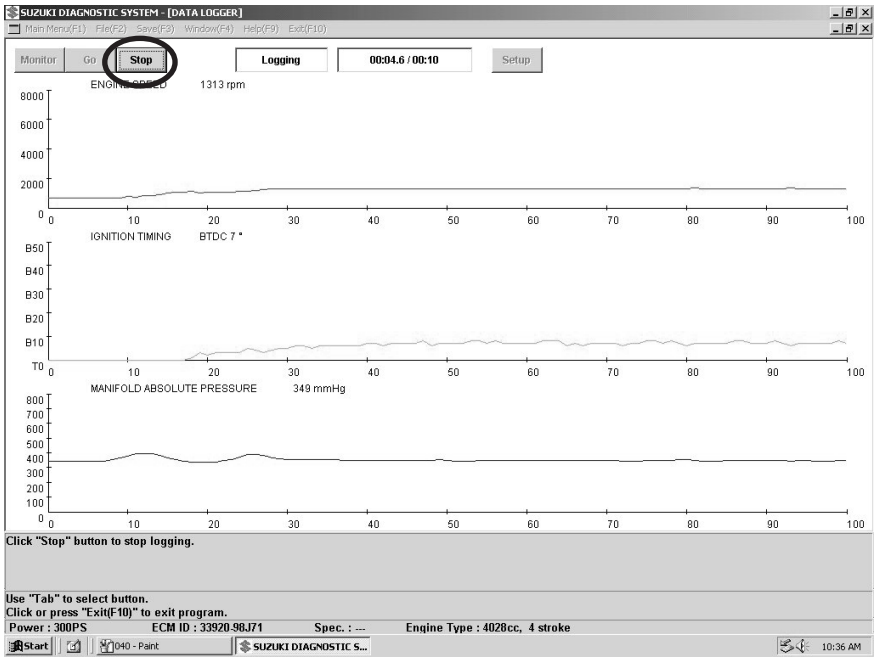


Fig.71

NOTE:

- *The “Go” button is available only when data is being monitored.*
- *Up to 100 points can be displayed in the window. The horizontal axis is automatically scrolled to the left if the number of logged (monitored) horizontal axis data exceeds 100 points.*
- *A point on the horizontal axis means the elapsed time for data logging or monitoring.*
  For example, if “0.5 sec” is entered as the sampling cycle in the Condition Setting window (Fig.68), 100 points serve as 50 seconds.

SAVING LOGGING DATA

You can save logging data in the “csv” file format after logging has finished (executed). (Fig.72)

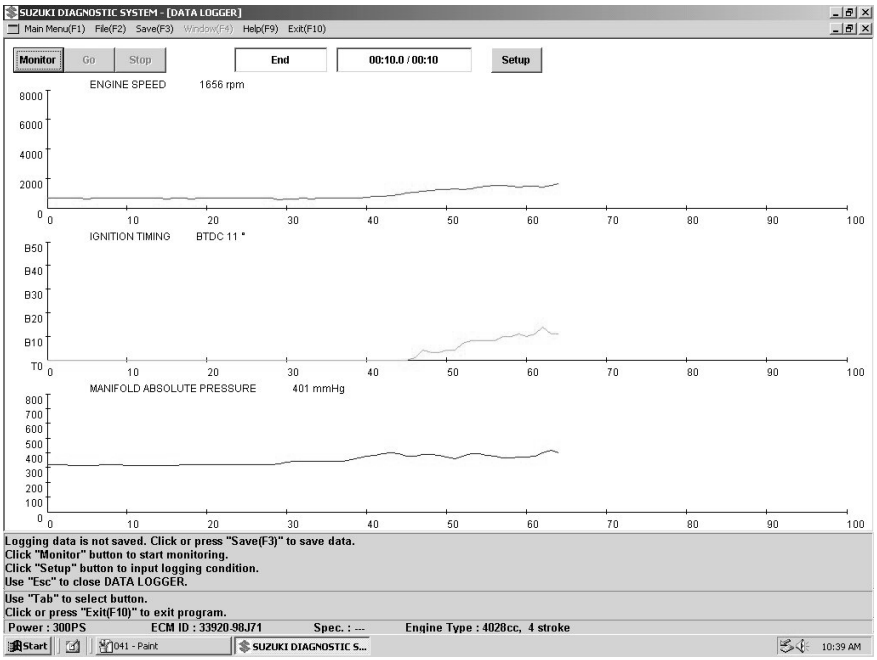


Fig.72

1. In the DATA LOGGER window (Fig.72), click the “Save(F3)” button (“F3” key on the keyboard). The COMMENT INPUT (DATA LOGGER) dialog box (Fig.73) appears. From this dialog box, type a comment into the Engine No., Boat Type, and Description fields and then click the “OK” button. To cancel logging data saving, click the “Cancel” button. (Keyboard) Move the cursor to the field in which to type a comment by using the “Tab” key. After typing the comment, move to the “OK” button by using the “Tab” key and press the “Enter” key to have the comment accepted.

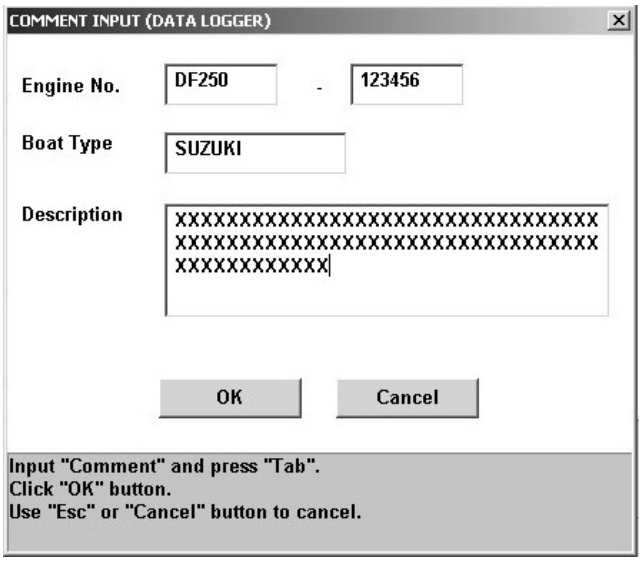


Fig.73

2. The “Save As” dialog box (Fig.74) appears.
   The file save destination (“DataGraph” folder) is automatically selected and the file name is also automatically displayed.

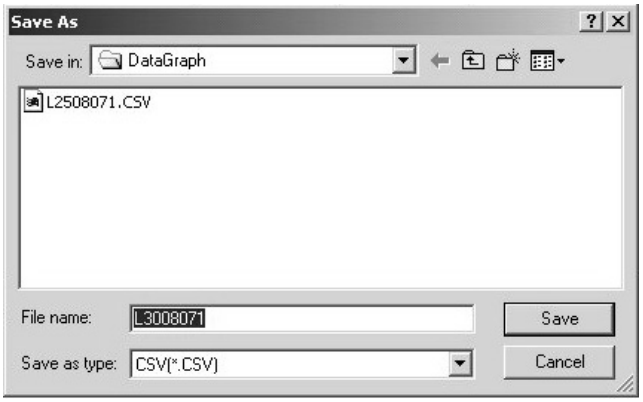


Fig.74

Default (initial) save destination directory
Windows 2000/XP
C:\Documents and Settings\All Users\Documents\SDS\DataGraph\Lxxxxxxx.csv
Windows Vista
C:\Users\Public\Documents\SDS\DataGraph\Lxxxxxxx.csv

NOTE:
You can change the file name and file save destination as required.

L X X X X X X X
① ② ③ ④

① Engine type ② Month (1.2.3.4.5.6.7.8.9.X.Y.Z) ③ Date (01 – 31) ④ Number (1 – 9, A – Z)	Example: L2508021 250 horsepower August 2 First file recorded on the above date

3. Click the “Save” button to save data.
   To cancel data save, click the “Cancel” button.
   (Keyboard) Move to the “Save” button and press the “Enter” key to have the saved data accepted or move to the “Cancel” button and press the “Enter” key to cancel the selected data.

NOTE:
When opening the saved logging data, refer to “Opening Saved Data” (Page 31) in this manual.

PRINTING A LOGGING DATA GRAPH

When the DATA LOGGER window is displayed, you can print a graph of up to 100 points (same as the range display in the window).

1. In the DATA LOGGER window (Fig.72), click the “File(F2)” button (“F2” key on the keyboard).
2. The Print dialog box (Fig.75) appears.
   Select a printer, print range, and the number of copies.
   To start printing, click the “OK” button. To cancel printing, click the “Cancel” button.
   (Keyboard) Move to the “OK” button by using the “Tab” key and press the “Enter” key to have the printing accepted or move to the “Cancel” button by using the “Tab” key and press the “Enter” key to have the cancellation accepted.

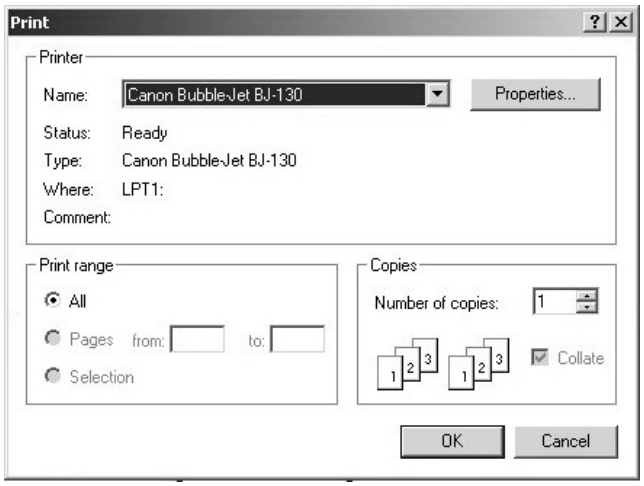


Fig.75

4-8. OTHER FUNCTIONS
"SERVICE INFORMATION" (* Currently, the corresponding electronic file is unavailable fro Suzuki Motor Corporation.)

You can add PDF versions of electronic file service manuals and parts catalogs.

1. In the Main Menu window (Fig.44), click the "Help(F9)" button ("F9" key on the keyboard).
2. The following dialog box appears. (Fig.76) Click the "Service data manual" button.
   (Keyboard) Move to the "Service data manual" button by using the "Up" or "Down" arrow key and press the "Enter" key to have the selected item accepted.

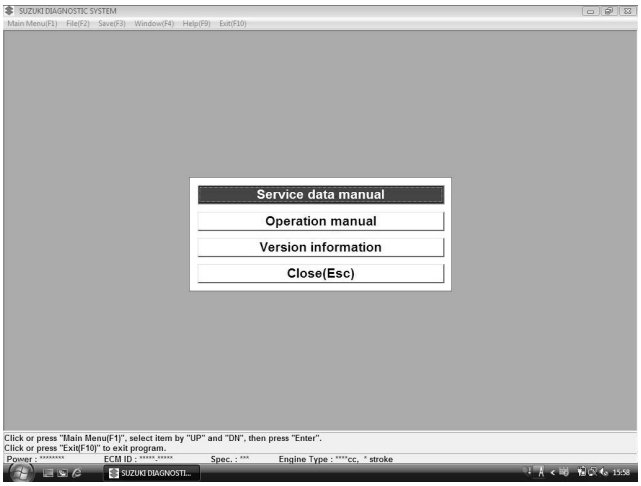


Fig.76

3. The Open dialog box appears. (Fig.77)
   Click a desired file and click the "Open" button.
   (Keyboard) To change the selected button to another button, use the "Tab" key. Select a desired file by using the "Up" or "Down" arrow key and press the "Enter" key to have the file accepted.

Default (initial) save destination directory
C:\Program Files\SDS\Manual\XXXXXXX

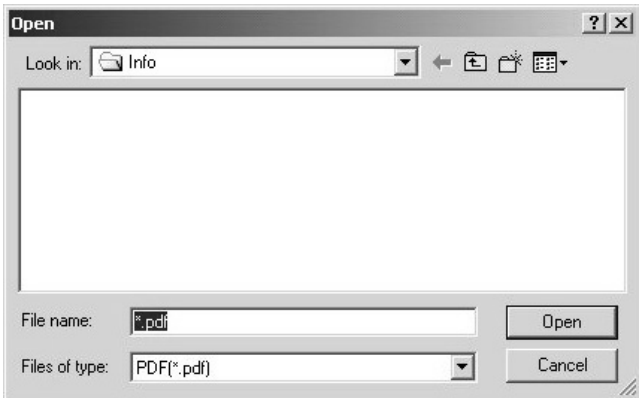


Fig.77

NOTE:

- *The following directory automatically opens. Change this directory if necessary.*
- *Save necessary files to the default (initial) save directory.*
- *Currently, electronic file service manuals and parts catalogs are unavailable from Suzuki Motor Corporation.*

“OPERATION MANUAL”

Operation Manual in the form of electronic file can be called out.

1. On the main menu (Fig.44), click “Help (F9)” button. (On the keyboard, press “F9” key)
2. Dialog box is shown. (Fig.76)
   Click “Operation Manual”.
   (On Keyboard) Select an item by pressing “Up” or “Down” arrow key, and press “Enter” key to confirm the entry.
3. Applicable application start up to display the operation manual. (Fig.78)

Default (initial) save destination directory
C:\Program Files\SDS\Manual\XXXXXXX

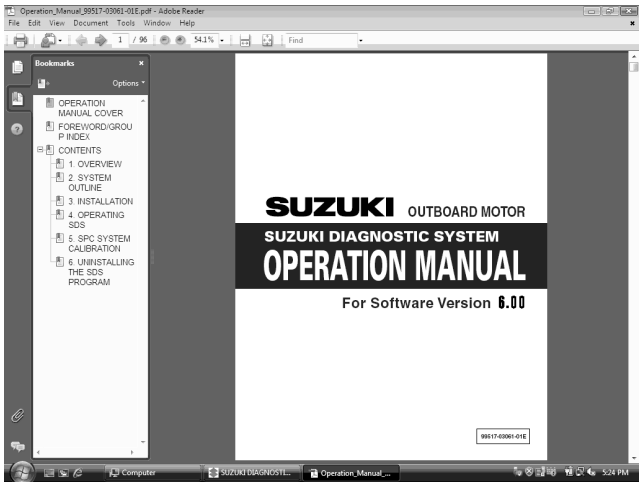


Fig.78

NOTE:

- *Adobe Acrobat or Adobe Reader is required to display the SDS operation manual.*
- *If the applicable application has not been installed, not the manual, but the open error screen (Fig.79) is shown.*
- *The operation manual is automatically incorporated, when installing SDS_Ver 6.00.*

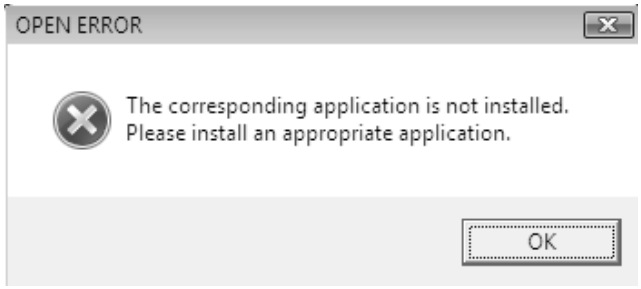


Fig.79

"VERSION INFORMATION"

You can check the SDS program version.

1. In the Main Menu window (Fig.44), click the "Help(F9)" button ("F9" key on the keyboard).
2. The dialog box (Fig.76) appears.
   Click the "Version Information" button.
   (Keyboard) Move to the "Version Information" button by using the "Up" or "Down" arrow key and press the "Enter" key to have the selected item accepted.
3. The VERSION INFORMATION dialog box appears. From this dialog box, you can check the current program version and database version. (Fig.80)
   Clicking the "Details" button displays the VERSION INFORMATION (DETAILS) dialog box from which you can check the details of version information. (Fig.81)

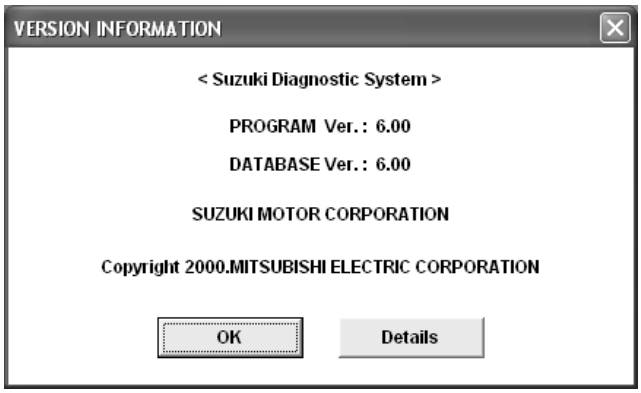


Fig.80

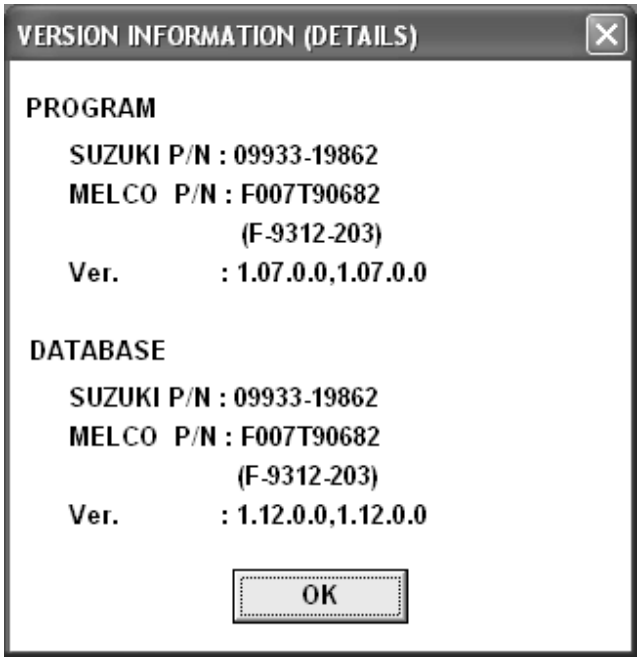


Fig.81

4-9. EXITING THE SDS PROGRAM

1. To exit the SDS program, click the "Exit(F10)" button in the main menu window ("F10" on the keyboard).
2. The EXIT dialog box (Fig.82) appears.
   To exit the program, click the "Yes" button. To cancel program existing, click the "No" button.
   (Keyboard) Move to the "Yes" button by using the "Tab" key and press the "Enter" key to have program exiting accepted. Or move to the "No" button and press the "Enter" key to have exiting cancellation accepted.

Fig.82

4-10. DATA ITEM GROUPS (DATA ITEM GROUP TABLE)

The following table shows the groups to which each data item belongs.

Items with " レ " mark can be freely selected and displayed.

Group No.1: Engine data (items that can be selected in "SERVICE DATA")
Group No.2: Caution Sys. Info. (items that can be selected in "SERVICE DATA")
Group No.3: Operation Hours (items that can be selected in "SERVICE DATA")
Group No.4: O_2 Feedback Info. (items that can be selected in "SERVICE DATA")
Group No.5: All Service Data (items that can be selected in "SERVICE DATA")
Group No.6: Data Logger (items that can be selected in "DATA LOGGER")

ITEM	UNIT	GROUP No.					
		1	2	3	4	5	6
ENGINE SPEED	r/min	レ			レ	レ	レ
IGNITION TIMING	°	レ				レ	レ
MANIFOLD ABSOLUTE PRESSURE	mmHg	レ			レ	レ	レ
MANIFOLD ABSOLUTE PRESSURE	kPa	レ			レ	レ	レ
MANIFOLD ABSOLUTE PRESSURE	inHg	レ			レ	レ	レ
BAROMETRIC PRESSURE	mmHg	レ				レ	レ
BAROMETRIC PRESSURE	kPa	レ				レ	レ
BAROMETRIC PRESSURE	inHg	レ				レ	レ
CYLINDER TEMPERATURE	℃	レ			レ	レ	レ
CYLINDER TEMPERATURE	˚F	レ			レ	レ	レ
INTAKE AIR TEMPERATURE	℃	レ				レ	レ
INTAKE AIR TEMPERATURE	˚F	レ				レ	レ
BATTERY VOLTAGE	V	レ				レ	レ
FUEL INJ. PULSE WIDTH	μs	レ				レ	レ
INJECTED FUEL AMOUNT	mcc	レ				レ	レ
FUEL CONSUMPTION (AVE)	l/h	レ				レ	レ
HIGH FUEL PUMP DUTY	%	レ				レ	レ
IAC VALVE DUTY	%	レ				レ	レ
PURGE VALVE DUTY	%	レ				レ	レ
EX-MANI TEMPERATURE (STBD)	℃	レ				レ	レ
EX-MANI TEMPERATURE (PORT)	℃	レ				レ	レ
EX-MANI TEMPERATURE (STBD)	˚F	レ				レ	レ
EX-MANI TEMPERATURE (PORT)	˚F	レ				レ	レ

ITEM	UNIT	GROUP No.					
		1	2	3	4	5	6
ETV TRGT ANGLE	°	レ				レ	レ
TPS MAIN	°	レ				レ	レ
TPS MAIN OUTPUT	V	レ				レ	レ
TPS SUB	°	レ				レ	レ
TPS SUB OUTPUT	V	レ				レ	レ
ESA TRGT POSITION	V	レ				レ	レ
SHIFT POSITION SNSR OUTPUT	V	レ				レ	レ
TRIM ANGLE	%	レ				レ	レ
TRIM ANGLE SNSR OUTPUT	V	レ				レ	レ
TILT LIMIT VOLTAGE	V	レ				レ	レ
BOAT SPEED (OVER WATER)	km/h	レ				レ	レ
BOAT SPEED (OVER WATER)	KNOT	レ				レ	レ
BOAT SPEED (OVER WATER)	mph	レ				レ	レ
SPEED SNSR OUTPUT	V	レ				レ	レ
WATER PRESSURE	kPa	レ				レ	レ
WATER PRESSURE	psi	レ				レ	レ
WATER PRESSURE SNSR OUTPUT	V	レ				レ	レ
TPS	°	レ				レ	レ
TPS OUTPUT	V	レ				レ	レ
NO. OF CMP FAILURE (VVT_STBD)	times		レ			レ	レ
NO. OF CMP FAILURE (VVT_PORT)	times		レ			レ	レ
VVT ADVANCE ANGLE (STBD)	°	レ				レ	レ
VVT ADVANCE ANGLE (PORT)	°	レ				レ	レ

ITEM	UNIT	GROUP No.					
		1	2	3	4	5	6
NO. OF VVT ADVANCE FAILURE (S)	times		✓			✓	✓
NO. OF VVT ADVANCE FAILURE (P)	times		✓			✓	✓
NO. OF OCV FAILURE (VVT_STBD)	times		✓			✓	✓
NO. OF OCV FAILURE (VVT_PORT)	times		✓			✓	✓
NO. OF CHECK CODE WIRE FAILURE	times		✓			✓	✓
NO. OF EX TEMP SNSR FAILURE (S)	times		✓			✓	✓
NO. OF EX TEMP SNSR FAILURE (P)	times		✓			✓	✓
NO. OF SPS FAILURE	times		✓			✓	✓
NO. OF TPS FAILURE	times		✓			✓	✓
NO. OF TRIM SENSOR FAILURE	times		✓			✓	✓
NO. OF SPEED SENSOR FAILURE	times		✓			✓	✓
NO. OF NEUTRAL SW FAILURE	times		✓			✓	✓
NO. OF INTAKE FAILURE	times		✓			✓	✓
NO. OF MAP SENSOR FAILURE	times		✓			✓	✓
NO. OF CKP SENSOR FAILURE	times		✓			✓	✓
NO. OF IAC VALVE FAILURE	times		✓			✓	✓
NO. OF CMP SENSOR FAILURE	times		✓			✓	✓
NO. OF CYL. TEMP. SNSR FAILURE	times		✓			✓	✓
NO. OF IAT SENSOR FAILURE	times		✓			✓	✓
NO. OF FUEL INJECTOR FAILURE	times		✓			✓	✓
NO. OF OVER-REVOLUTION	times		✓			✓	✓
NO. OF LOW BATTERY VOLTAGE	times		✓			✓	✓
NO. OF LOW OIL PRESSURE	times		✓			✓	✓
NO. OF OVERHEAT (GRADIENT)	times		✓			✓	✓
NO. OF OVERHEAT (TEMP.)	times		✓			✓	✓
NO. OF ETV FAILURE (ECM)	times		✓			✓	✓
NO. OF ETV FAILURE (MTR)	times		✓			✓	✓
NO. OF ETV FAILURE (MOV)	times		✓			✓	✓

ITEM	UNIT	GROUP No.					
		1	2	3	4	5	6
NO. OF DBW SYSTEM FAILURE	times		✓			✓	✓
NO. OF ESA FAILURE (ECM)	times		✓			✓	✓
NO. OF ESA FAILURE (MTR)	times		✓			✓	✓
NO. OF ESA FAILURE (MOV)	times		✓			✓	✓
SYSTEM FORMATION (STA)	Station		✓			✓	
SYSTEM FORMATION (ENG)	Engine		✓			✓	
SYSTEM FORMATION (ENG.POSITION)	-		✓			✓	
TOTAL OPERATION TIME (HRS.)	h			✓	✓	✓	
TOTAL OPERATION TIME (MIN.)	min			✓	✓	✓	
0-1000 R/MIN	min			✓		✓	
1000-2000 R/MIN	min			✓		✓	
2000-3000 R/MIN	min			✓		✓	
3000-4000 R/MIN	min			✓		✓	
4000-5000 R/MIN	min			✓		✓	
5000-6000 R/MIN	min			✓		✓	
ABOVE 6000 R/MIN	min			✓		✓	
ELAPSE TIME FROM REMINDER CANCEL	h			✓		✓	
NO. OF OIL CHANGE REMINDER	times			✓		✓	
COMPENSATION FACTOR(ZONE 1)					✓	✓	
COMPENSATION FACTOR(ZONE 2)					✓	✓	
COMPENSATION FACTOR(ZONE 3)					✓	✓	
TIME OF LAST O_2 FEEDBACK					✓	✓	
O_2 FEEDBACK	h				✓		
EMERGENCY STOP SWITCH	ON/OFF	✓				✓	✓
CTP SWITCH	ON/OFF	✓				✓	✓
NEUTRAL SWITCH	ON/OFF	✓				✓	✓
START SW	ON/OFF	✓				✓	✓
VSV (MI)	ON/OFF	✓				✓	✓
LOW FUEL PUMP	ON/OFF	✓				✓	✓
SHIFT POSITION TRGT	FOREWARD NEUTRAL REVERSE	✓				✓	
SHIFT POSITION	FOREWARD NEUTRAL REVERSE	✓				✓	

ITEM	UNIT	GROUP No.					
		1	2	3	4	5	6
CAUTION SYSTEM NAME (1)			∠			∠	
ENGINE SPEED (1)	r/min		∠			∠	
MANIFOLD ABSOLUTE PRESSURE (1)	mmHg		∠			∠	
MANIFOLD ABSOLUTE PRESSURE (1)	kPa		∠			∠	
MANIFOLD ABSOLUTE PRESSURE (1)	inHg		∠			∠	
CYLINDER TEMPERATURE (1)	℃		∠			∠	
CYLINDER TEMPERATURE (1)	˚F		∠			∠	
INTAKE AIR TEMPERATURE (1)	℃		∠			∠	
INTAKE AIR TEMPERATURE (1)	˚F		∠			∠	
EX-MANI TEMPERATURE (STBD)(1)	℃		∠			∠	
EX-MANI TEMPERATURE (PORT)(1)	℃		∠			∠	
EX-MANI TEMPERATURE (STBD)(1)	˚F		∠			∠	
EX-MANI TEMPERATURE (PORT)(1)	˚F		∠			∠	
ACCELERATION VOLTAGE (1)	V		∠			∠	
TPS MAIN VOLTAGE (1)	V		∠			∠	
TPS SUB VOLTAGE (1)	V		∠			∠	
SHIFT POSITON (1)	V		∠			∠	
SPS VOLTAGE (1)	V		∠			∠	
BATTERY VOLTAGE (1)	V		∠			∠	
FAILURE TIME (1)	h		∠			∠	
FAILURE TIME (1)	min		∠			∠	
ELAPSE OF TIME (1)	min		∠			∠	
CAUTION SYSTEM NAME (2)			∠			∠	
ENGINE SPEED (2)	r/min		∠			∠	
MANIFOLD ABSOLUTE PRESSURE (2)	mmHg		∠			∠	
MANIFOLD ABSOLUTE PRESSURE (2)	kPa		∠			∠	
MANIFOLD ABSOLUTE PRESSURE (2)	inHg		∠			∠	
CYLINDER TEMPERATURE (2)	℃		∠			∠	
CYLINDER TEMPERATURE (2)	˚F		∠			∠	
INTAKE AIR TEMPERATURE (2)	℃		∠			∠	
INTAKE AIR TEMPERATURE (2)	˚F		∠			∠	
EX-MANI TEMPERATURE (STBD)(2)	℃		∠			∠	
EX-MANI TEMPERATURE (PORT)(2)	℃		∠			∠	
EX-MANI TEMPERATURE (STBD)(2)	˚F		∠			∠	
EX-MANI TEMPERATURE (PORT)(2)	˚F		∠			∠	
ACCELERATION VOLTAGE (2)	V		∠			∠	
TPS MAIN VOLTAGE (2)	V		∠			∠	
TPS SUB VOLTAGE (2)	V		∠			∠	
SHIFT POSITON (2)	V		∠			∠	
SPS VOLTAGE (2)	V		∠			∠	
BATTERY VOLTAGE (2)	V		∠			∠	
FAILURE TIME (2)	h		∠			∠	
FAILURE TIME (2)	min		∠			∠	
ELAPSE OF TIME (2)	min		∠			∠	

ITEM	UNIT	GROUP No.					
		1	2	3	4	5	6
CAUTION SYSTEM NAME (3)			∠			∠	
ENGINE SPEED (3)	r/min		∠			∠	
MANIFOLD ABSOLUTE PRESSURE(3)	mmHg		∠			∠	
MANIFOLD ABSOLUTE PRESSURE(3)	kPa		∠			∠	
MANIFOLD ABSOLUTE PRESSURE(3)	inHg		∠			∠	
CYLINDER TEMPERATURE (3)	℃		∠			∠	
CYLINDER TEMPERATURE (3)	˚F		∠			∠	
INTAKE AIR TEMPERATURE (3)	℃		∠			∠	
INTAKE AIR TEMPERATURE (3)	˚F		∠			∠	
EX-MANI TEMPERATURE (STBD)(3)	℃		∠			∠	
EX-MANI TEMPERATURE (PORT)(3)	℃		∠			∠	
EX-MANI TEMPERATURE (STBD)(3)	˚F		∠			∠	
EX-MANI TEMPERATURE (PORT)(3)	˚F		∠			∠	
ACCELERATION VOLTAGE (3)	V		∠			∠	
TPS MAIN VOLTAGE (3)	V		∠			∠	
TPS SUB VOLTAGE (3)	V		∠			∠	
SHIFT POSITON (3)	V		∠			∠	
SPS VOLTAGE (3)	V		∠			∠	
BATTERY VOLTAGE (3)	V		∠			∠	
FAILURE TIME (3)	h		∠			∠	
FAILURE TIME (3)	min		∠			∠	
ELAPSE OF TIME (3)	min		∠			∠	

ITEM	UNIT	GROUP No.					
		1	2	3	4	5	6
SPC CAUTION SYSTEM NAME (1)-1			✓			✓	
ENGINE SPEED (1)-1	r/min		✓			✓	
MANIFOLD ABSOLUTE PRESSURE (1)-1	mmHg		✓			✓	
MANIFOLD ABSOLUTE PRESSURE (1)-1	kPa		✓			✓	
MANIFOLD ABSOLUTE PRESSURE (1)-1	inHg		✓			✓	
CYLINDER TEMPERATURE (1)-1	℃		✓			✓	
CYLINDER TEMPERATURE (1)-1	˚F		✓			✓	
INTAKE AIR TEMPERATURE (1)-1	℃		✓			✓	
INTAKE AIR TEMPERATURE (1)-1	˚F		✓			✓	
EX-MANI TEMPERATURE (STBD) (1)-1	℃		✓			✓	
EX-MANI TEMPERATURE (STBD) (1)-1	˚F		✓			✓	
EX-MANI TEMPERATURE (PORT) (1)-1	℃		✓			✓	
EX-MANI TEMPERATURE (PORT) (1)-1	˚F		✓			✓	
ACCELERATION VOLTAGE (1)-1	V		✓			✓	
TPS MAIN VOLTAGE (1)-1	V		✓			✓	
TPS SUB VOLTAGE (1)-1	V		✓			✓	
SHIFT POSITION (1)-1	V		✓			✓	
SPS VOLTAGE (1)-1	V		✓			✓	
BATTERY VOLTAGE (1)-1	V		✓			✓	
FAILURE TIME (1)-1	h		✓			✓	
FAILURE TIME (1)-1	min		✓			✓	
SPC CAUTION SYSTEM NAME (1)-2			✓			✓	
ENGINE SPEED (1)-2	r/min		✓			✓	
MANIFOLD ABSOLUTE PRESSURE (1)-2	mmHg		✓			✓	
MANIFOLD ABSOLUTE PRESSURE (1)-2	kPa		✓			✓	
MANIFOLD ABSOLUTE PRESSURE (1)-2	inHg		✓			✓	
CYLINDER TEMPERATURE (1)-2	℃		✓			✓	
CYLINDER TEMPERATURE (1)-2	˚F		✓			✓	
INTAKE AIR TEMPERATURE (1)-2	℃		✓			✓	
INTAKE AIR TEMPERATURE (1)-2	˚F		✓			✓	
EX-MANI TEMPERATURE (STBD) (1)-2	℃		✓			✓	
EX-MANI TEMPERATURE (STBD) (1)-2	˚F		✓			✓	
EX-MANI TEMPERATURE (PORT) (1)-2	℃		✓			✓	
EX-MANI TEMPERATURE (PORT) (1)-2	˚F		✓			✓	
ACCELERATION VOLTAGE (1)-2	V		✓			✓	
TPS MAIN VOLTAGE (1)-2	V		✓			✓	
TPS SUB VOLTAGE (1)-2	V		✓			✓	
SHIFT POSITION (1)-2	V		✓			✓	
SPS VOLTAGE (1)-2	V		✓			✓	
BATTERY VOLTAGE (1)-2	V		✓			✓	

ITEM	UNIT	GROUP No.					
		1	2	3	4	5	6
SPC CAUTION SYSTEM NAME (2)-1			✓			✓	
ENGINE SPEED (2)-1	r/min		✓			✓	
MANIFOLD ABSOLUTE PRESSURE (2)-1	mmHg		✓			✓	
MANIFOLD ABSOLUTE PRESSURE (2)-1	kPa		✓			✓	
MANIFOLD ABSOLUTE PRESSURE (2)-1	inHg		✓			✓	
CYLINDER TEMPERATURE (2)-1	℃		✓			✓	
CYLINDER TEMPERATURE (2)-1	˚F		✓			✓	
INTAKE AIR TEMPERATURE (2)-1	℃		✓			✓	
INTAKE AIR TEMPERATURE (2)-1	˚F		✓			✓	
EX-MANI TEMPERATURE (STBD) (2)-1	℃		✓			✓	
EX-MANI TEMPERATURE (STBD) (2)-1	˚F		✓			✓	
EX-MANI TEMPERATURE (PORT) (2)-1	℃		✓			✓	
EX-MANI TEMPERATURE (PORT) (2)-1	˚F		✓			✓	
ACCELERATION VOLTAGE (2)-1	V		✓			✓	
TPS MAIN VOLTAGE (2)-1	V		✓			✓	
TPS SUB VOLTAGE (2)-1	V		✓			✓	
SHIFT POSITION (2)-1	V		✓			✓	
SPS VOLTAGE (2)-1	V		✓			✓	
BATTERY VOLTAGE (2)-1	V		✓			✓	
FAILURE TIME (2)-1	h		✓			✓	
FAILURE TIME (2)-1	min		✓			✓	
SPC CAUTION SYSTEM NAME (2)-2			✓			✓	
ENGINE SPEED (2)-2	r/min		✓			✓	
MANIFOLD ABSOLUTE PRESSURE (2)-2	mmHg		✓			✓	
MANIFOLD ABSOLUTE PRESSURE (2)-2	kPa		✓			✓	
MANIFOLD ABSOLUTE PRESSURE (2)-2	inHg		✓			✓	
CYLINDER TEMPERATURE (2)-2	℃		✓			✓	
CYLINDER TEMPERATURE (2)-2	˚F		✓			✓	
INTAKE AIR TEMPERATURE (2)-2	℃		✓			✓	
INTAKE AIR TEMPERATURE (2)-2	˚F		✓			✓	
EX-MANI TEMPERATURE (STBD) (2)-2	℃		✓			✓	
EX-MANI TEMPERATURE (STBD) (2)-2	˚F		✓			✓	
EX-MANI TEMPERATURE (PORT) (2)-2	℃		✓			✓	
EX-MANI TEMPERATURE (PORT) (2)-2	˚F		✓			✓	
ACCELERATION VOLTAGE (2)-2	V		✓			✓	
TPS MAIN VOLTAGE (2)-2	V		✓			✓	
TPS SUB VOLTAGE (2)-2	V		✓			✓	
SHIFT POSITION (2)-2	V		✓			✓	
SPS VOLTAGE (2)-2	V		✓			✓	
BATTERY VOLTAGE (2)-2	V		✓			✓	

ITEM	UNIT	GROUP No.					
		1	2	3	4	5	6
SPC CAUTION SYSTEM NAME (3)-1			レ			レ	
ENGINE SPEED (3)-1	r/min		レ			レ	
MANIFOLD ABSOLUTE PRESSURE (3)-1	mmHg		レ			レ	
MANIFOLD ABSOLUTE PRESSURE (3)-1	kPa		レ			レ	
MANIFOLD ABSOLUTE PRESSURE (3)-1	inHg		レ			レ	
CYLINDER TEMPERATURE (3)-1	℃		レ			レ	
CYLINDER TEMPERATURE (3)-1	˚F		レ			レ	
INTAKE AIR TEMPERATURE (3)-1	℃		レ			レ	
INTAKE AIR TEMPERATURE (3)-1	˚F		レ			レ	
EX-MANI TEMPERATURE (STBD) (3)-1	℃		レ			レ	
EX-MANI TEMPERATURE (STBD) (3)-1	˚F		レ			レ	
EX-MANI TEMPERATURE (PORT) (3)-1	℃		レ			レ	
EX-MANI TEMPERATURE (PORT) (3)-1	˚F		レ			レ	
ACCELERATION VOLTAGE (3)-1	V		レ			レ	
TPS MAIN VOLTAGE (3)-1	V		レ			レ	
TPS SUB VOLTAGE (3)-1	V		レ			レ	
SHIFT POSITION (3)-1	V		レ			レ	
SPS VOLTAGE (3)-1	V		レ			レ	
BATTERY VOLTAGE (3)-1	V		レ			レ	
FAILURE TIME (3)-1	h		レ			レ	
FAILURE TIME (3)-1	min		レ			レ	
SPC CAUTION SYSTEM NAME (3)-2			レ			レ	
ENGINE SPEED (3)-2	r/min		レ			レ	
MANIFOLD ABSOLUTE PRESSURE (3)-2	mmHg		レ			レ	
MANIFOLD ABSOLUTE PRESSURE (3)-2	kPa		レ			レ	
MANIFOLD ABSOLUTE PRESSURE (3)-2	inHg		レ			レ	
CYLINDER TEMPERATURE (3)-2	℃		レ			レ	
CYLINDER TEMPERATURE (3)-2	˚F		レ			レ	
INTAKE AIR TEMPERATURE (3)-2	℃		レ			レ	
INTAKE AIR TEMPERATURE (3)-2	˚F		レ			レ	
EX-MANI TEMPERATURE (STBD) (3)-2	℃		レ			レ	
EX-MANI TEMPERATURE (STBD) (3)-2	˚F		レ			レ	
EX-MANI TEMPERATURE (PORT) (3)-2	℃		レ			レ	
EX-MANI TEMPERATURE (PORT) (3)-2	˚F		レ			レ	
ACCELERATION VOLTAGE (3)-2	V		レ			レ	
TPS MAIN VOLTAGE (3)-2	V		レ			レ	
TPS SUB VOLTAGE (3)-2	V		レ			レ	
SHIFT POSITION (3)-2	V		レ			レ	
SPS VOLTAGE (3)-2	V		レ			レ	
BATTERY VOLTAGE (3)-2	V		レ			レ	

EXPLANATION OF DATA ITEMS

ENGINE SPEED/R/MIN
Indicates the engine speed within a range from 0 r/min to 8 000 r/min.

IGNITION TIMING/°
Indicates the ignition timing in the range from ATDC 10° to BTDC 40°.

MANIFOLD ABSOLUTE PRESSURE/mmHg, kpa, inHg
Indicates intake manifold pressure within a range from 0 mmHg to 800 mmHg.

BAROMETRIC PRESSURE/mmHG, kpa, inHg
Indicates barometric pressure within a range from 700 mmHg to 780 mmHg. (Atmospheric pressure is 760mmHg) (0 kpa to 120 kpa, 0 inHg to 30 inHg)

CYLINDER TEMPERATURE / °C, °F
Indicates the cylinder wall temperature in the range from –20 °C to 180 °C. (0°F to 360 °F)

INTAKE AIR TEMPERATURE / °C, °F
Indicates intake air temperature within a range from –20 °C to 100 °C. (0°F to 200 °F)

BATTERY VOLTAGE/ V
Indicates battery voltage within a range from 6 V to 16 V.

FUEL INJ. PULSE WIDTH/μs
Injection time duration for each cylinder per 1 time.

INJECTED FUEL AMOUNT/mcc
Injected fuel amount for each cylinder per 1 time. 1 mcc is 0.001 L.

FUEL CONSUMPTION (AVE) /lh
Indicates the fuel flow rate per hour and the average fuel flow rate in the range from 0 to 150 L.

HIGH-PRESSURE FUEL PUMP DUTY/ %
Indicates the high-pressure pump actuation rate within a range from 0% to 100%; indicates the actuation of the high-pressure fuel pump that pressure-feeds high-pressure fuel to the injector at a rate of “ON” time to one cycle (1 ms).

IAC VALVE DUTY/ %
Indicates the IAC valve actuation rate within a range from 0% to 100%; indicates the actuation of the IAC valve that controls the amount of air flowing from the IAC path at a rate of “ON” time to one cycle (1 ms).

PURGE VALVE DUTY/ %
Indicates the purge control valve actuation rate within a range from 0% to 100%.

EX-MANI TEMPERATURE/ °C, °F
Indicates the exhaust manifold temperature within a range from –20 °C to 180 °C. (0°F to 360 °F)

ETV TRGT ANGLE / °
Indicates the target throttle opening in the range from 0 to approx. 90° based on data transmitted from master BCM to ECM of the outboard motor.

TPS MAIN / °
Indicates the throttle opening in the range from 0 to approx. 90°.

TPS MAIN OUTPUT / V
Indicates the throttle position sensor main output voltage within a range from 0 V to 5 V.

TPS SUB (OPENING) / °
Indicates the throttle opening in the range from 0 to 45°.

TPS SUB OUTPUT / V
Indicates the throttle position sensor sub output voltage within a range from 0 V to 5 V.

ESA TRGT POSITION / V
Indicates the target shift position in the range from 0 to 5 V based on the data transmitted from the master BCM to ECM of the outboard motor.

SHIFT POSITION SENSOR OUTPUT / V
Indicates the output voltage of the shift position sensor in the range from 0 to 5 V.

TRIM ANGLE / %
Indicates the trim sensor angle within a range from 0% to 100%.
For full trim down, this angle is 0%. For full trim up, this angle is 100%.

TRIM ANGLE SNSR OUTPUT / V
Indicates the trim sensor output voltage within a range from 0 V to 5 V.

TILT LIMIT VOLTAGE / V
Indicates the tilt up limit set in the range 0 to 5 V maximum.

BOAT SPEED (OVER WATER) / km/h, KNOT, mph
Indicates the speed to water within a range from 0 km/h to 160 km/h (0 KNOT to 86 KNOT, 0 mph to 100 mph).

SPEED SENSOR OUTPUT / V
Indicates the output voltage of the speed sensor in the range from 0 to 5 V.

WATER PRESSURE / kpa, psi
Indicates the cooling water pressure in the range from 0 to 150 kpa (0 to 20 psi).

WATER PRESSURE SNSR OUTPUT / V
Indicates the output voltage of water pressure sensor in the range from 0 to 5 V.

THROTTLE POSITION ANGLE / °
Indicates the throttle position opening within a range from 0° to 100°.

THROTTLE POSITION SENSOR OUTPUT / V
Indicates the throttle position sensor output voltage within a range from 0 V to 5 V.

VVT ADVANCE ANGLE (STBD/PORT) / °
Indicates the VVT advance angle within a range from 0° to 50°.

NO. OF CHECK CODE WIRE FAILURE / times (DF150/DF175/DF200/DF225/DF250)
Indicated when the model discrimination terminal is disconnected.

XXXXXX FAILURE / times
Indicates the total number of abnormal signals sent from sensors and switches.
NO. OF XXXXXX / times
Indicates the total number of over-revolution, oil pressure, battery voltage, and overheat(*) cautions that occurred.
* Two overheat cautions are displayed: gradient and temperature.

CAUTION SYSTEM NAME (1), (2) and (3)
Indicates caution names (indication of past three cautions).
If no cautions occurred in the past, “No code” is displayed.

XXXXXXXXXXXX (AT CAUTION OCCURRENCE) (1), (2), (3)
Indicates the numeric value of each caution.
If no caution occurred for the cylinder, intake, and EX-MANI (STBD, PORT) temperatures in the past, “–50 °C” is displayed for them.

SPC CAUTION SYSTEM NAME XXXXXX
SPC: Abbreviation of SUZUKI PRECISION CONTROL
Indicates the data of the electronic throttle, electronic shift and communication system in the event of a trouble.
(*)-1 Indicates data of the electronic throttle, electronic shift and communication system at the time of trouble.
(*)-2 Indicates data of the electronic throttle, electronic shift or communication system 5 seconds after the occurrence of the trouble.

FAILURE TIME (1), (2), (3) / hour
Indicates the total operation time when a caution occurred.

ELAPSE OF TIME (1), (2), (3) / minute
Indicates the elapsed time from caution occurrence.

ELAPSE TIME FROM REMINDER CANCEL / hour
Elapsed time from the latest cancellation of the OIL CHANGE REMINDER system activation.

NO. OF OIL CHANGE REMINDER / times
Indicates the total number of times display of the OIL CHANGE REMINDER system was cancelled.

O_2 FEEDBACK
Indicates the O_2 feedback status (“STAND-BY”, “ACTION”, “FIN.OK”, or “FIN.NG”).

COMPENSATION FACTOR (ZONE X)
Indicates the compensation factor of fuel injection time.
The initial status is “1.000”.

TIME OF LAST O_2 FEEDBACK
Indicates the total operation time when the latest O_2 feedback was perform.

XXXXXX SWITCH AND OTHERS
Indicates the status (ON or OFF) of the emergency stop switch, idle switch, neutral switch, vacuum switching valve, and low-pressure fuel pump.

SHIFT POSITION
Indicates the shift position (FORWARD, NEUTRAL, REVERSE).

5. SPC SYSTEM CALIBRATION

⚠ WARNING

Electronic calibration is required bofore use. After installation of this product, the Suzuki Precision Control system requires electronic calibration, only by a person who has been specifically trained in the Suzuki Precision Control system.
Improper electronic calibration of the system will make this product and/or the system inoperable or unsafe for use.

5-1. CONNECTING PC AND BCM

1. Connect your PC to the BCM of the outboard motor by using the following special tools. (Fig.83)

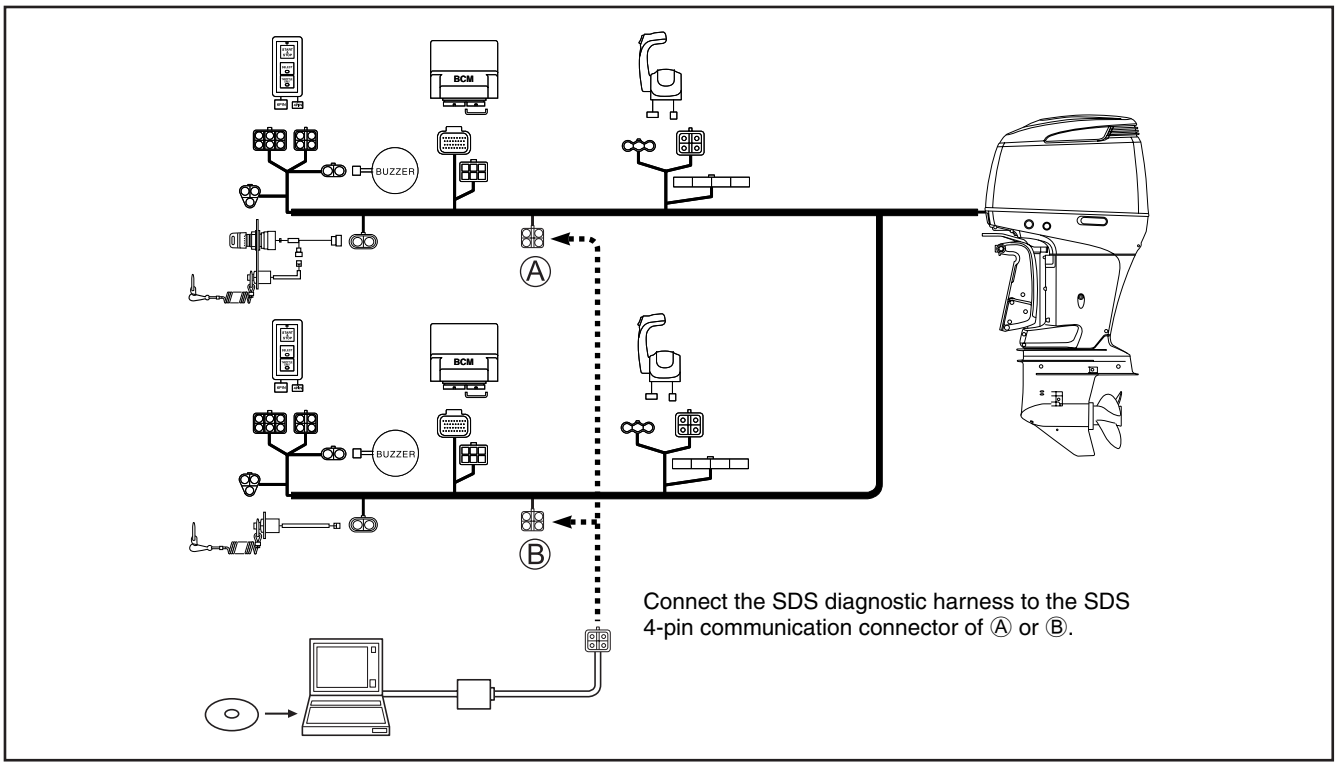


Fig.83

NOTE:

- *Check that your PC and the main switch of the outboard motor are off before connecting the diagnostic harness.*
- *If two stations are available, a master BCM and sub BCM are installed. To calibrate the system, connect the diagnostic harness to the master BCM (main switch side BCM).*
  (If only one station is available, only the master BCM is installed.)

5-2. BCM MAIN MENU

1. Start the SDS program. (See page 23.)
2. The SDS program window (Fig.84) appears.

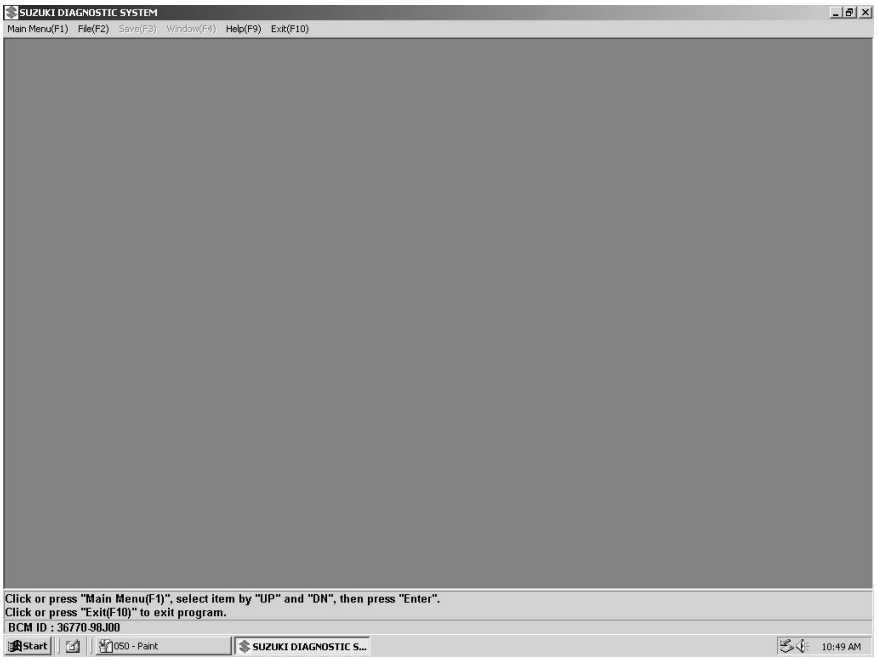


Fig.84

3. Click the “Main Menu(F1)” button (“F1” key on the keyboard). The following Menu dialog box appears. The BCM part number is displayed in the lower left of this dialog box. (Fig.85)

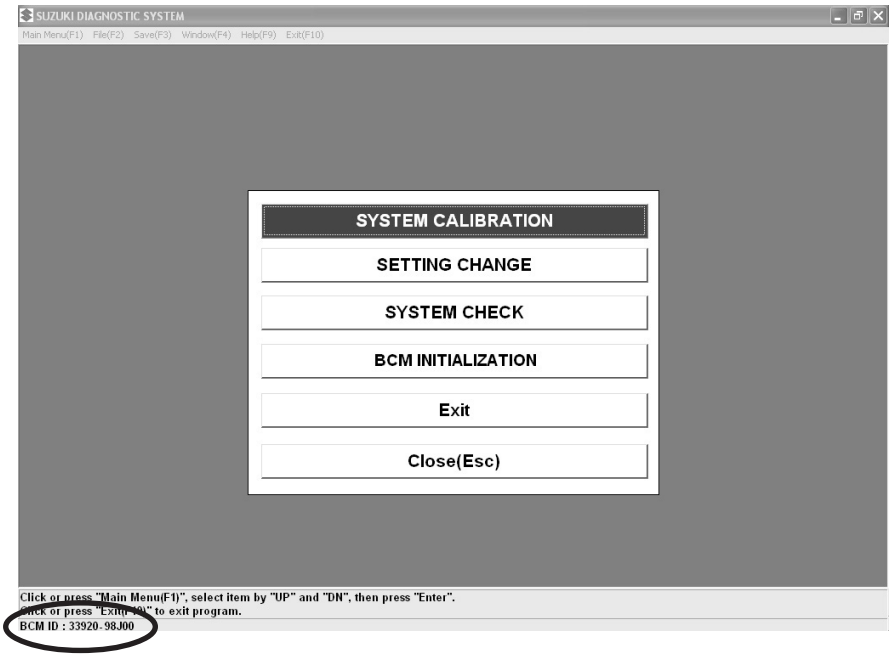


Fig.85

SYSTEM CALIBRATION
Calibrate the SPC system and registers information of outboard motor, and remote control box in the BCM.
Perform this item when an outboard motor, remote control box, and meters, are first installed on the boat. Also perform this item when the BCM is replaced or the ECM or remote control box of the outboard motor is replaced.

SETTING CHANGE
Sets, changes, or resets the remote control lever, and tilt down.
Perform this item when the remote control box is disassembled or when the tilt position is changed.

SYSTEM CHECK
Enables you to check the system configuration registered in the master BCM.

BCM INITIALIZATION
Deletes the BCM information (master or sub) registered in the BCM after system calibration and system configuration information (*Number of engine, Number of station).

Exit
Exits the SDS program.

Close (Esc)
Closes the menu box.

CAUTION
• **The ECM or BCM calibrated in one boat cannot be reused in another boat. To reuse the ECM or BCM, be sure to calibrate the system after deleting the BCM information by using the BCM INITIALIZATION menu.** • **The BCM INITIALIZATION menu cannot be used to delete the diagnostic information registered in the BCM.** • **Use the BCM INITIALIZATION menu to delete information for the connected BCM. (To delete information for the master BCM, connect the diagnostic harness to the master BCM. To delete information for the sub BCM, connect the diagnostic harness to the sub BCM.)**

5-3. SYSTEM CALIBRATION

Calibrate the system and register information in the BCM.

- **SYSTEM FORMATION REGISTRATION**
  Sets the number of stations and the number of engines and registers information in the BCM. If two stations are available, also registers information in both the master BCM and sub BCM.

- **ENGINE LOCATION REGISTRATION**
  Registers the positions (PORT, CENTER, STBD) of engines in the BCM.

- **LEVER POSITION CALIBRATION**
  Registers the position (Forward: full opening, full closing, neutral, Reverse: full opening, full closing) of the remote control lever in the BCM.

CAUTION
To change the system configuration after system calibration, be sure to initialize the system by using the BCM INITIALIZATION menu. *** Example: The system is calibrated as a single engine and then the single engine is changed to the dual engine.**

1. Clicking the “SYSTEM CALIBRATION” button from the Main Menu dialog box (Fig.85) displays the following NOTICE window. (Fig.86)
   (Keyboard) Select a desired item by using the “Up” or “Down” arrow key and press the “Enter” key to have the selected item accepted.
   Click the “OK” button and proceed to the next step.

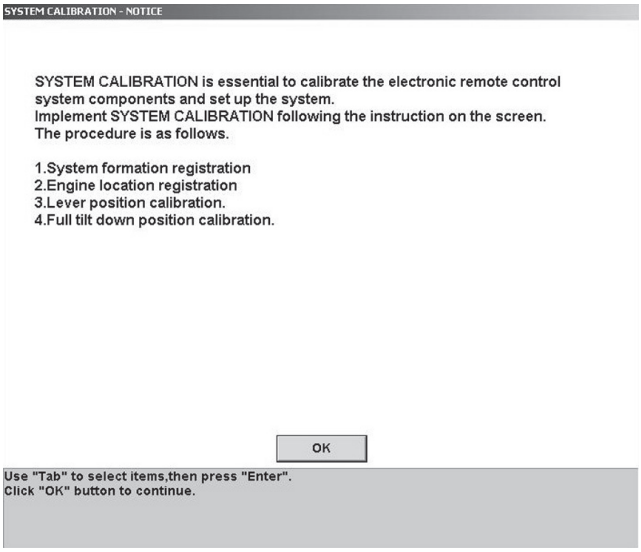


Fig.86

2. The following window (Fig.87) appears. Click the “OK” button and proceed to the next step (“Enter” key on the keyboard).

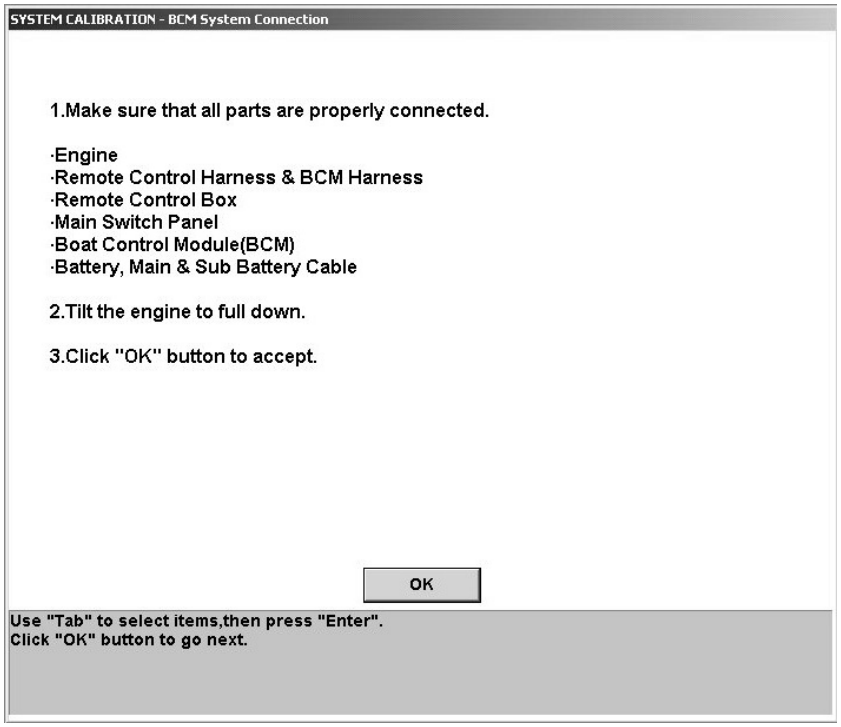


Fig.87

NOTE:
If the BCM has already been calibrated, the Confirmation window appears. (Fig.88)

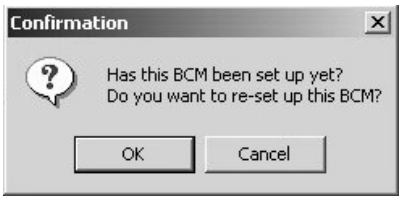


Fig.88

3. The following window appears (Fig.89). Click the “OK” button and proceed to the next step (“Enter” key on the keyboard).

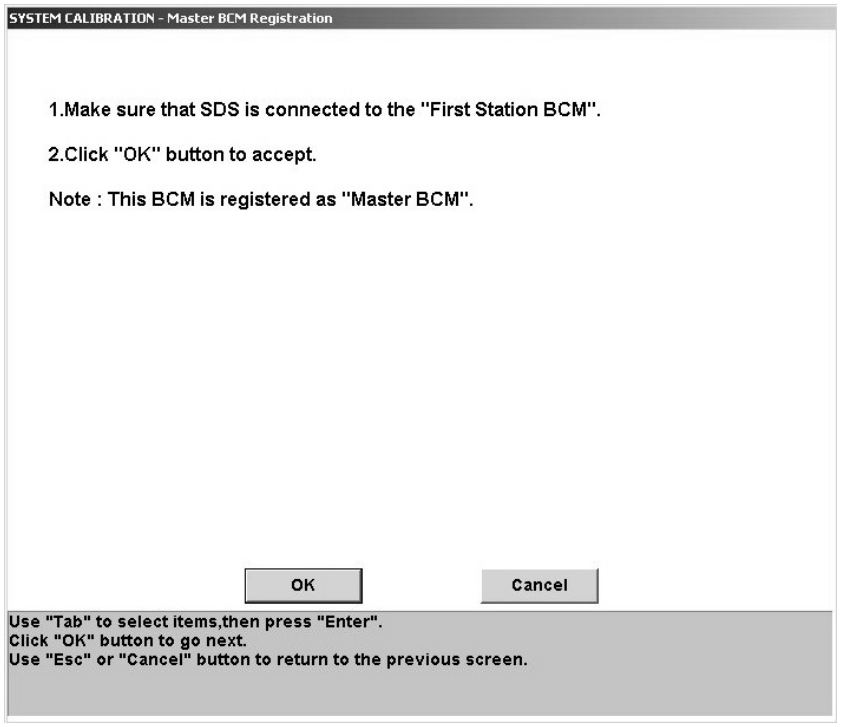


Fig.89

NOTE:

- *The station to which SDS was connected is registered as the master BCM. If SDS is connected to the BCM of the second station and the system is calibrated, the BCM of the second station serves as the master BCM.*
- *If the "Cancel" button is clicked or the "Esc" key is pressed during system calibration, the window shown at right (Fig.90) appears. Click the "OK" button to calibrate the system. To continue system calibration, click the "Cancel" button.*

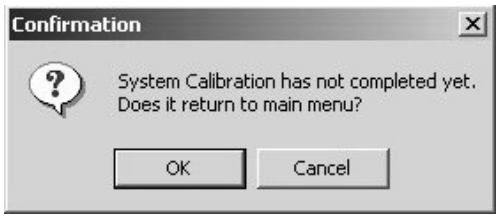


Fig.90

4. The following window (Fig.91) appears. This window is used to register the system configuration.
   In this window, select the number of stations and the number of engines by clicking the ▼ button, click the "OK" button, and proceed to the next step.
   (Keyboard) Move to a desired item by using the "Tab" key. Select a desired item by using the "Up" or "Down" arrow key and press the "Enter" key to have the selected item accepted.
   Clicking the "Cancel" button cancels system calibration.

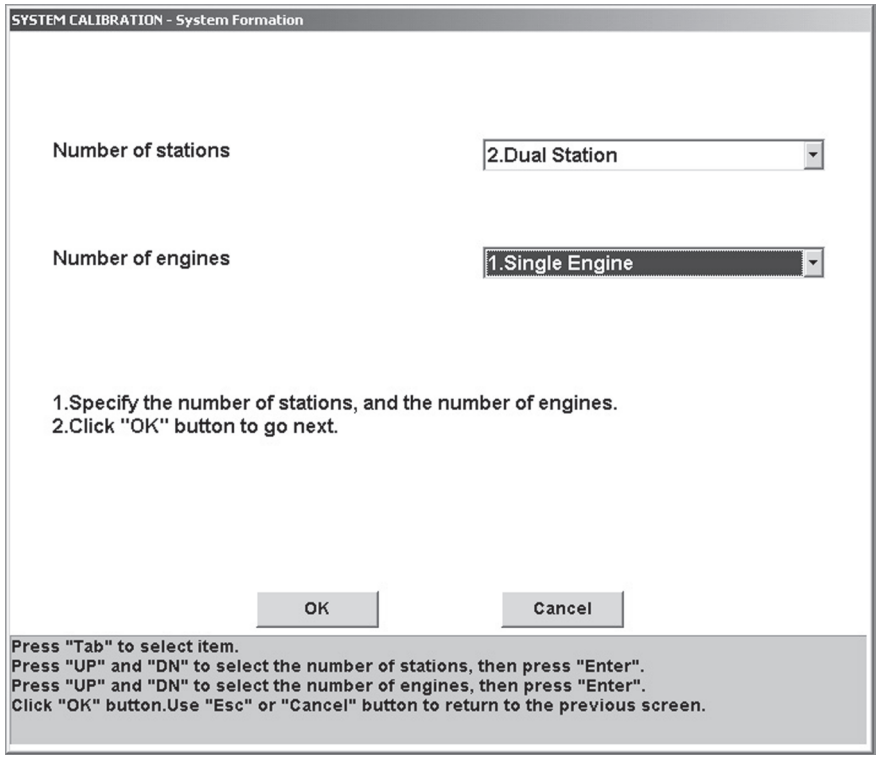


Fig.91

NOTE:

- *If you make a selection different from the actual configuration, the error screen is displayed. (Fig. 91-1)*
- *If the number of engines actually connected is larger than that previously selected, it cannot be detected as an error, and the error screen (Fig.91-1) is not displayed.*

Fig.91-1

5. The following window (Fig.92) appears. Check that the calibration are correct, click the “OK” button, and proceed to the next step (“Enter” key on the keyboard).
   Clicking the “Cancel” button brings you back to the previous window.

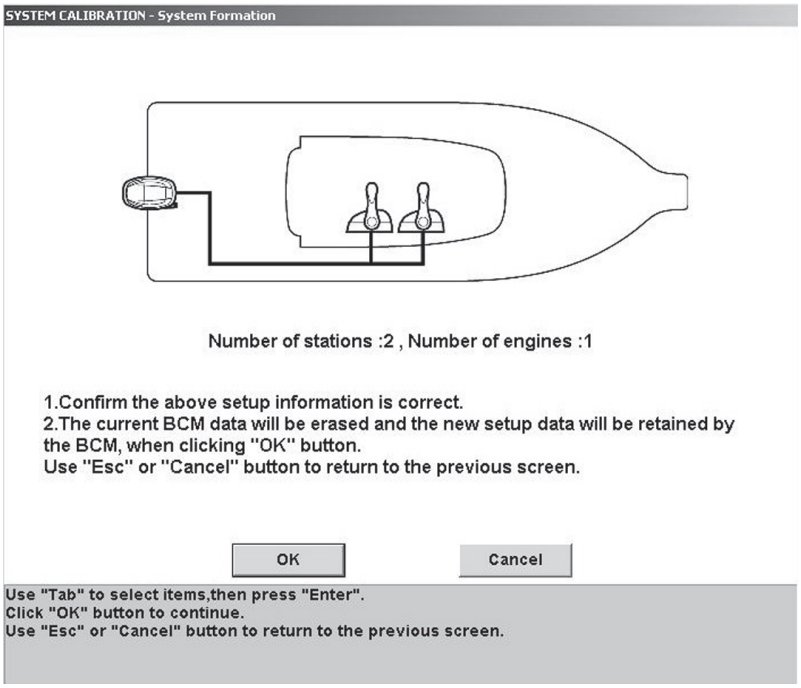


Fig.92

6. The following window (Fig.93) appears. This window is used to register the outboard motor position in the BCM.
   Operate the PTT switch of the outboard motor to perform full tilt down.
   Click the “OK” button to have the outboard motor position accepted and proceed to the next step. (Fig.93 is an example of registering the PORT outboard motor.)
   Clicking the “Cancel” button cancels system calibration.

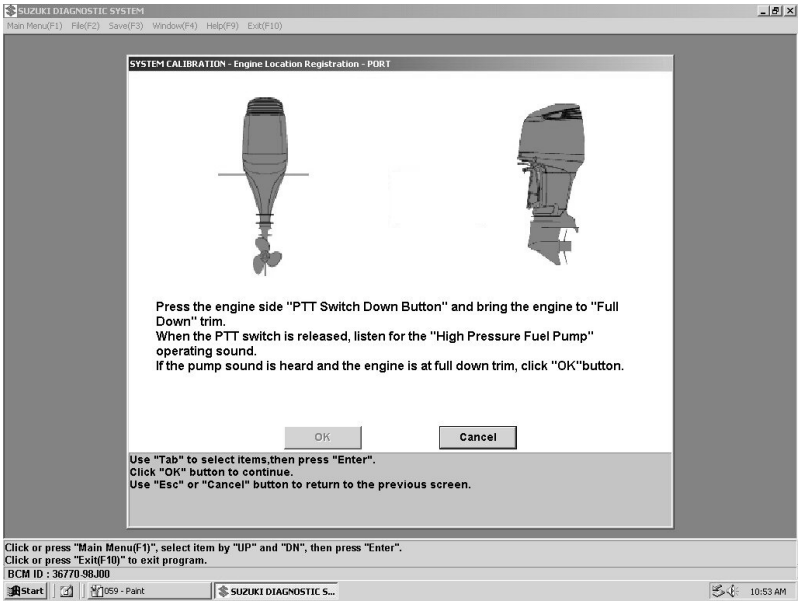


Fig.93

NOTE:

- *For dual engines, register the PORT and STBD positions. For triple engines, register the PORT, CENTER, and STBD positions.*
- *After full tilt down, the high-pressure fuel pump of the outboard motor is actuated for 3 seconds. Listen for the actuation sound.*

7. The following window (Fig.94) appears. This window is used to register the position of the remote control lever in the BCM.
   Set the lever to each position (Forward, Neutral, Reverse) and click the “Set” button.
   If the set lever positions are correctly registered, “√” mark is displayed in the “Status” column in the right side of the window.
   Repeat the same operation to register all the lever positions.
   Clicking the “Cancel” button cancels system calibration.

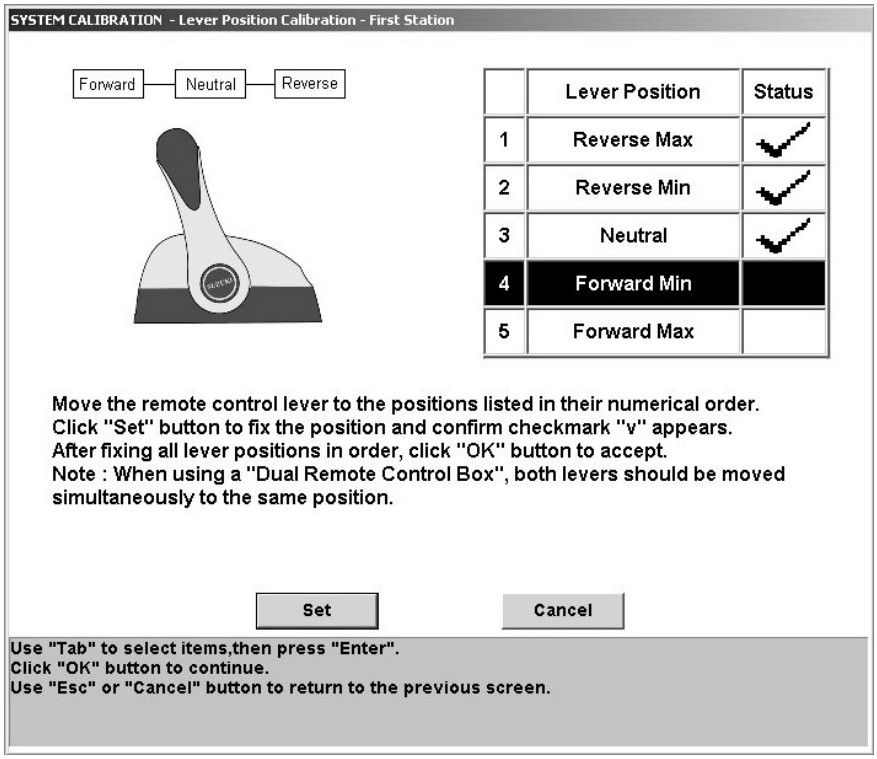


Fig.94

NOTE:
For a dual control box, you must simultaneously operate both levers.

8. When all the lever positions have been registered, return the lever to the neutral position. (Fig.95)

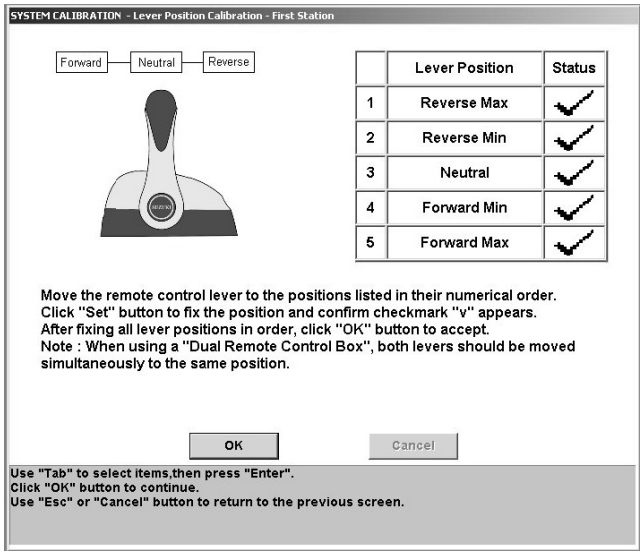


Fig.95

NOTE:

- *If the lever is not set to a correct position, the error message (Fig.96) is displayed. Click the “OK” button, set the lever to the correct position, and click the “Set” button.*
- *After all the lever positions have been registered, the following confirmation message (Fig.97) is displayed.*

Fig.96

Fig.97

9. Clicking the “OK” button displays the following window (Fig.98): Click the “OK” button to terminate system calibration.

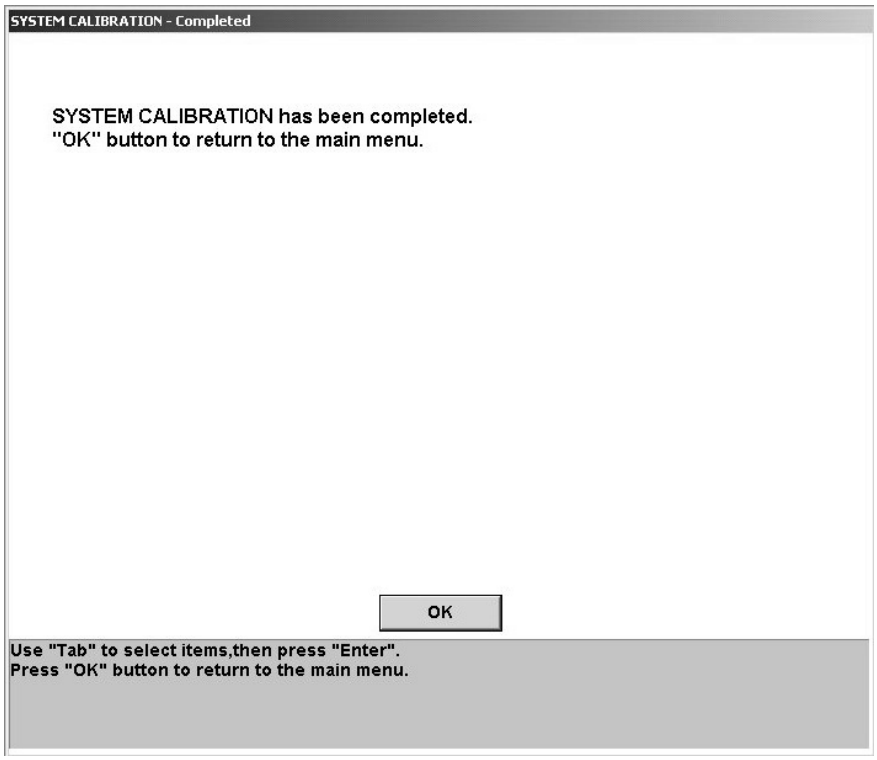


Fig.98

5-4. SETTING CHANGE

Change or reset the remote control lever characteristics and full tilt down position.

NOTE:

Change system settings when disassembling or replacing the remote control lever, its related parts, or tilt-related parts.

5-4-1. LEVER CHARACTERISTICS

1. Clicking the “SETTING CHANGE” button from the Main Menu dialog box (Fig.85) displays the following window (Fig.99, Fig.100) of boat station configuration registered in the BCM during system calibration.
   * Fig.99 is the “SETTING CHANGE” initial window registered as the single station.
   * Fig.100 is the “SETTING CHANGE” initial window registered as the dual station.

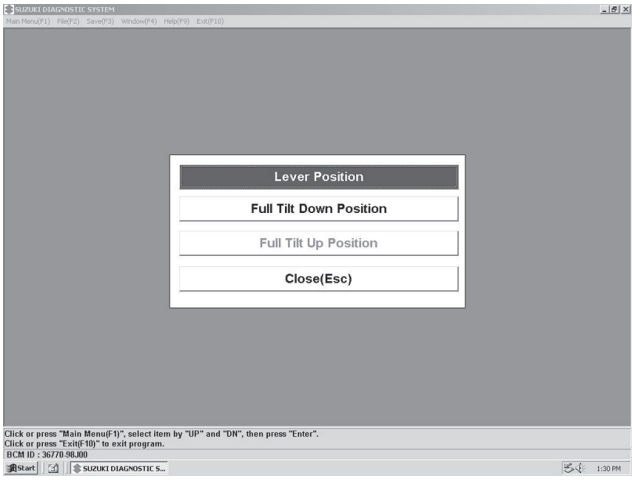


Fig.99

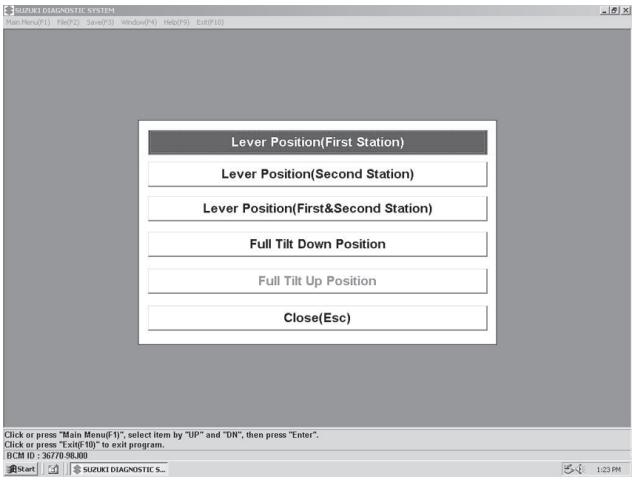


Fig.100

2. Clicking “LEVER POSITION (XXXXXX)” button from the Setup Change dialog box (Fig.99, Fig.100) displays the following window (Fig.101):
   Set the lever to each position (Forward, Neutral, Reverse) and click the “Set” button.
   If the set lever positions are correctly registered, “√” mark is displayed in the “Status” column in the right side of the window.
   Repeat the same operation to register all the lever positions.
   Clicking the “Cancel” button cancels system setting change.

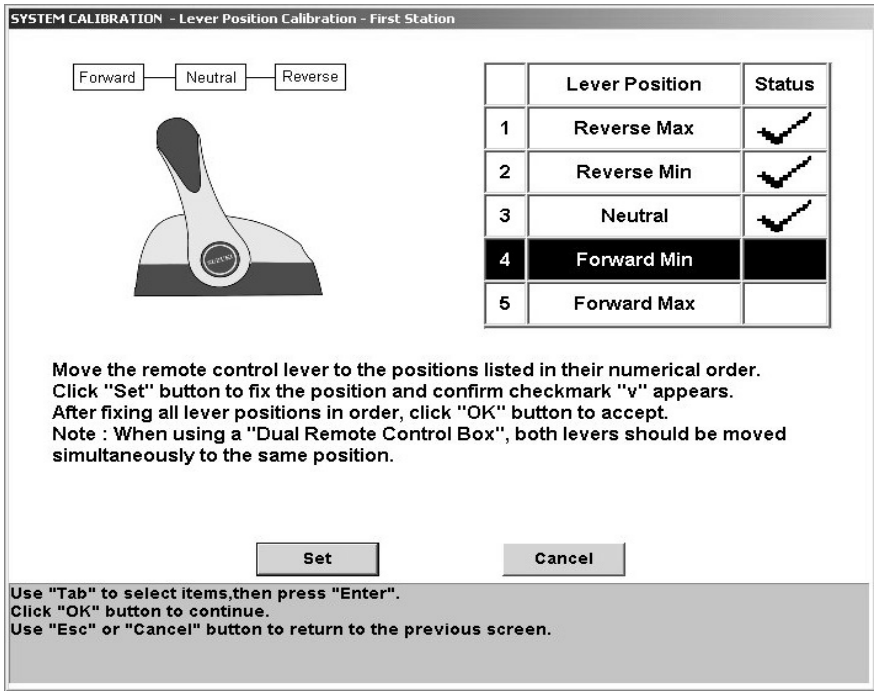


Fig.101

NOTE:
For a dual control box, you must simultaneously operate both levers.

3. When all the lever positions have been registered, return the lever to the neutral position. (Fig.102)

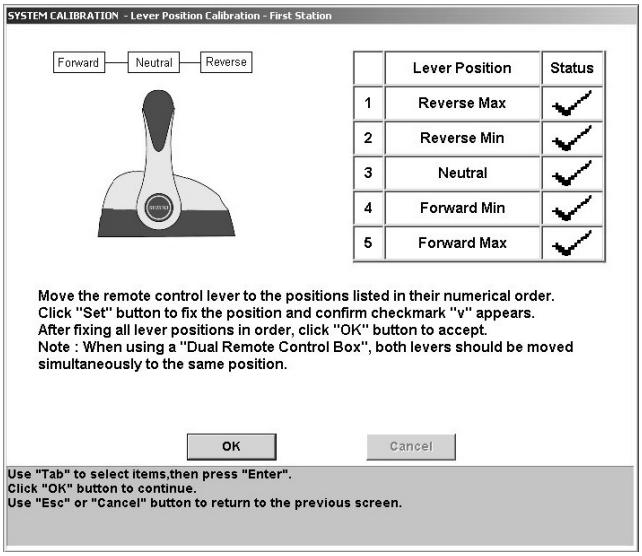


Fig.102

NOTE:

- *If the lever is not set to a correct position, the error message (Fig.103) is displayed. Click the "OK" button, set the lever to the correct position, and click the "Set" button.*
- *To change the dual station settings, select "First Station", "Second Station", and "Both First and Second Stations."*
- *After all the lever positions have been registered, the following confirmation message (Fig.104) is displayed:*

Fig.103

Fig.104

4. Clicking the "OK" button after all the lever positions have been registered displays the following window (Fig.105):
   Click the "OK" button to terminate setting change.

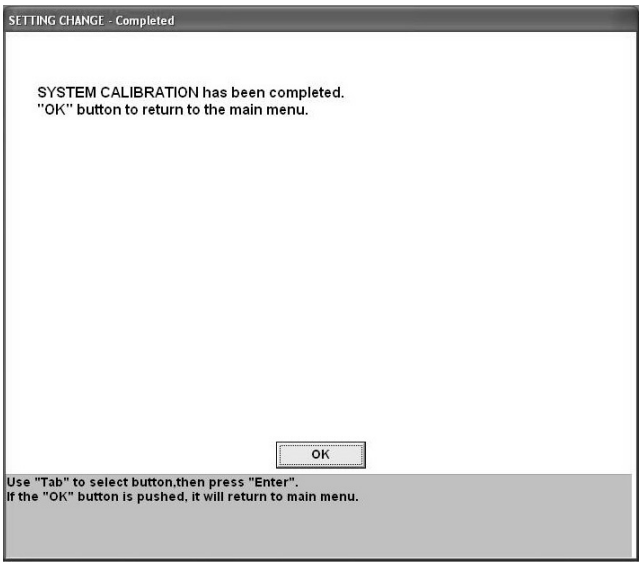


Fig.105

5-4-2. Full Tilt Down Position

1. Clicking the “Full Tilt Down Position” button from the SETTING CHANGE dialog box (Fig.99) displays the window. (Fig.106)
2. Operate the PTT switch of the outboard motor to perform full tilt down.
   Clicking the “OK” button registers the full tilt down position and redisplays the SETTING CHANGE completed window. (Fig.105)
   Click the “OK” button to complete setup change.

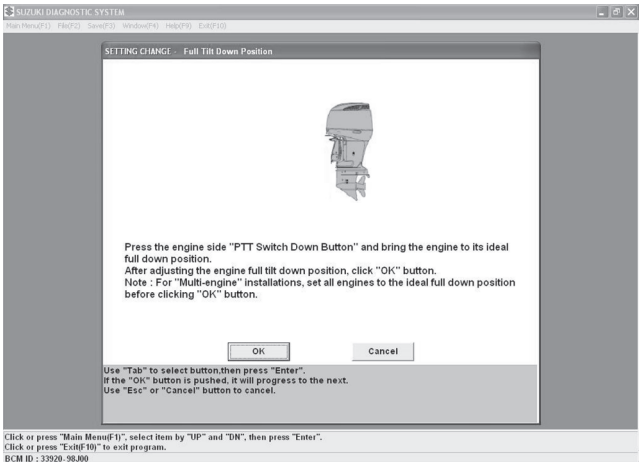


Fig.106

5-5. SYSTEM CHECK

Check system settings.

SYSTEM CONFIGURATION

1. Clicking the “SYSTEM CHECK” button from the Main Menu dialog box (Fig.85) displays the following menu window. (Fig.107)

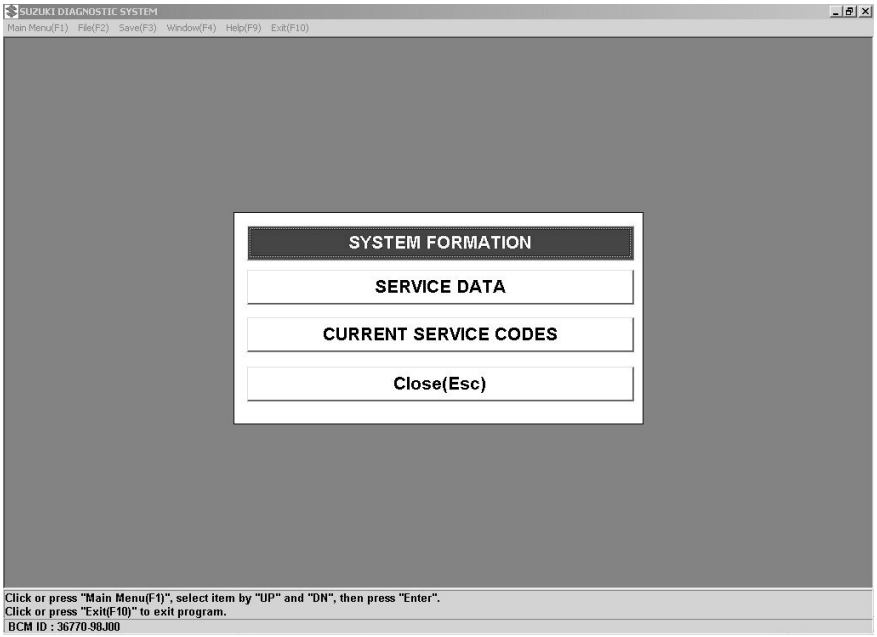


Fig.107

2. Clicking the “SYSTEM FORMATION” button from the menu window (Fig.107) displays the window. (Fig.108)
   The upper part of this window illustrates the system configuration registered in the BCM.
   The following figure shows a dual station of triple outboard motor type.
   The lower part of this window shows the master BCM ID, sub BCM ID, PORT ECM ID, CENTER ECM ID, and STBD ECM ID.
   Click the “OK” button to terminate system check.

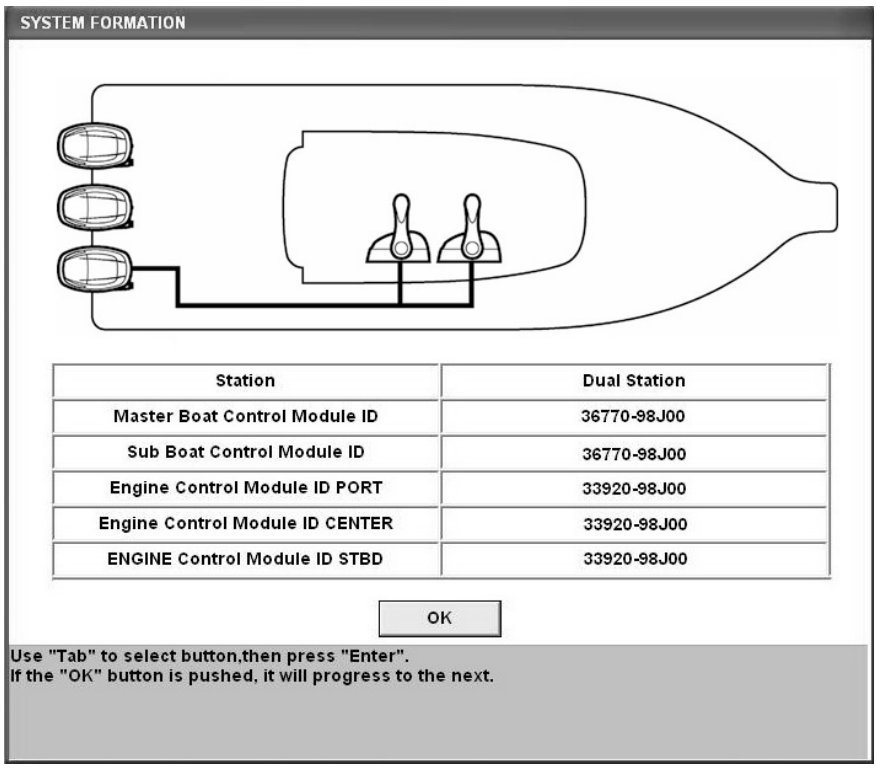


Fig.108

NOTE:
If the illustration and description of the displayed system configuration differ from the registered configuration and the configuration of actual boat, it means that the system is not correctly calibrate.
In this case, be sure to calibrate the system.

3. Clicking the “SERVICE DATA” button from the menu window (Fig.107) displays the window. (Fig.109)
   This window displays master BCM service data in real time.

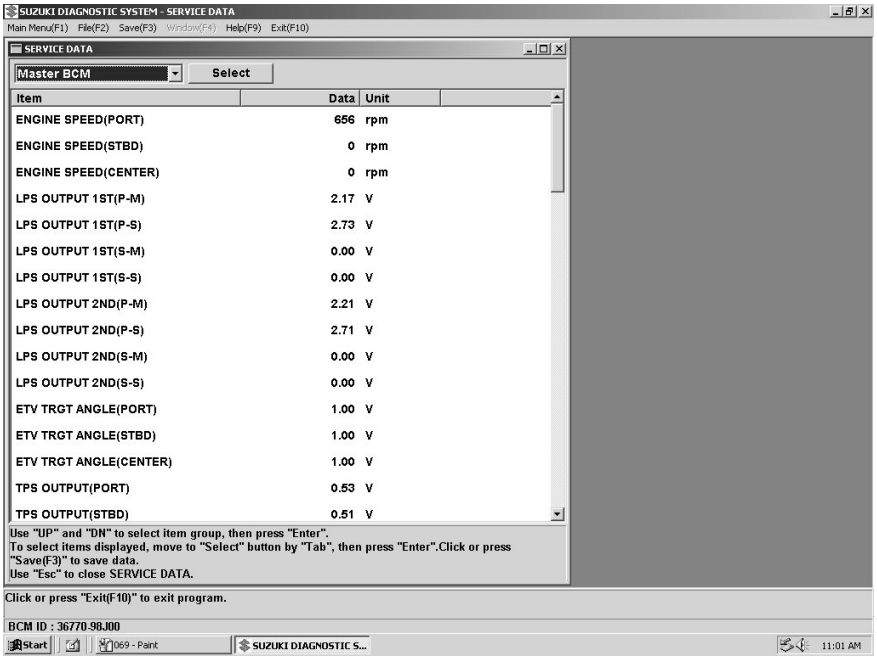


Fig.109

4. You can select service data for the connected outboard motor (ECM) by clicking the ▼ button. (Fig.110)
   (Keyboard) Select a desired menu by using the “Up” or “Down” arrow key and press the “Enter” key.

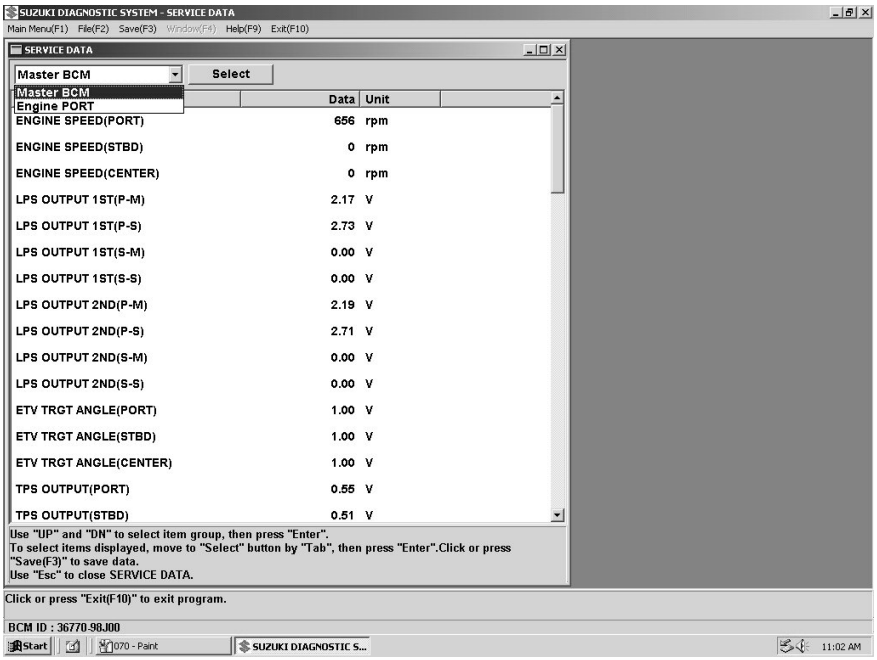


Fig.110

NOTE:
Refer to “BCM DATA ITEM GROUP TABLE” (page 80) of this manual for items which can be called out respectively from the service data of the outboard motor (ECM) connected with the master BCM.

5. You can select whether to display or hide the windows of service data for the outboard motor (ECM) with SDS connected to the master BCM. To select an item whose window you want to display, click the “Select” button.
   (Keyboard) Move to the “Select” button by using the “Tab” key and press the “Enter” key.

6. The ITEM SELECTION (SERVICE DATA) dialog box appears. (Fig.111)
   Items are displayed when their check boxes are selected (check boxes with “√” mark). Items are not displayed when their check boxes are cleared (check boxes without “√” mark). You select whether to display or hide an item by clicking the check box.
   (Keyboard) To display or hide an item, select it by using the “Up” or “Down” arrow key and press the “Space” key. To have the selected item accepted, move to the “OK” button by using the “Tab” key and press the “Enter” key.

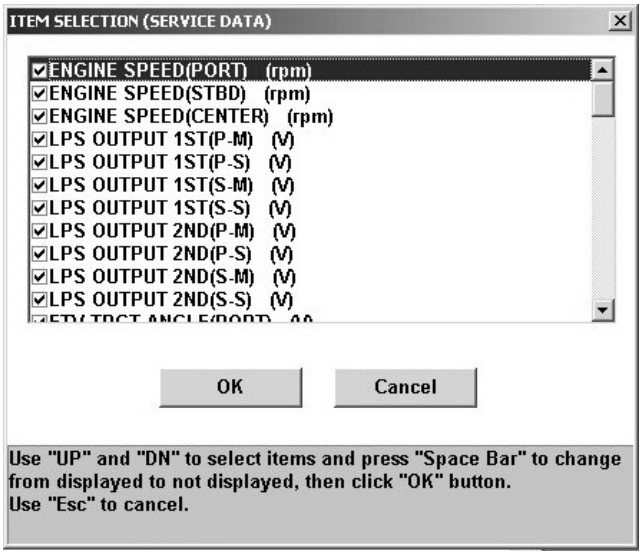


Fig.111

NOTE:
- *Clicking the “Cancel” button ignores the selected item and makes the previous selection valid.*
- *Pressing the “Esc” key ignores the selected item and makes the previous selection valid.*

SAVING BCM SERVICE DATA

You can save all the displayed service data for the outboard motor (ECM) with SDS connected to the master BCM.

1. In the SERVICE DATA window (Fig.93) of the outboard motor (ECM) connected to the master BCM, click the “Save(F3)” button (“F3” key on the keyboard). The COMMENT INPUT (SERVICE DATA) dialog box appears. From this dialog box, type a comment into the Engine No., Boat Type, and Description fields and then click the “OK” button. (Fig.112)
   (Keyboard) Move the cursor to the field in which to type a comment by using the “Tab” key. After typing the comment, move to the “OK” button by using the “Tab” key and press the “Enter” key to have the comment accepted.

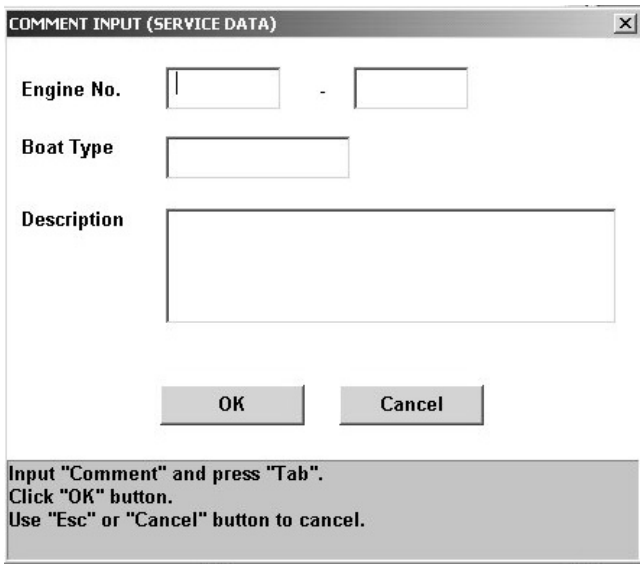


Fig.112

NOTE:
When opening the saved service data, refer to “Opening Saved Data” (Page 31) in this manual.
Service data is saved when you click the “Save(F3)” button (“F3” key on the keyboard).

2. The “Save As” dialog box appears. (Fig.113)
   The file save destination (“DataList” folder) is automatically selected and the file name is also automatically displayed.

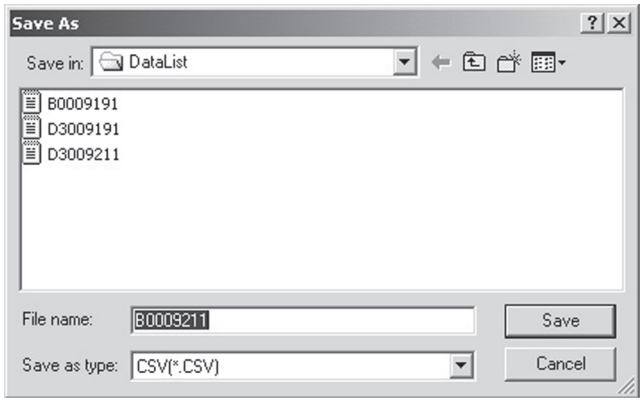


Fig.113

Default (initial) save destination directory
Windows 2000/XP
C:\Documents and Settings\All Users\Documents\SDS\DataList\BXXXXXXX.csv
Windows Vista
C:\Users\Public\Documents\SDS\DataList\BXXXXXXX.csv

NOTE:
You can change the file name and file save destination as required.

B X X X X X X X

① ② ③ ④

① Engine type ② Month (1.2.3.4.5.6.7.8.9.X.Y.Z) ③ Date (01 – 31) ④ Number (1 – 9, A – Z)	Example: B3007251 300 horsepower July 25 First file recorded on the above date

3. Click the “Save(S)” button to save data.
   To cancel data save, click the “Cancel” button.
   (Keyboard) Move to the “save” button and press the “Enter” key to have the saved data accepted or move to the “Cancel” button and press the “Enter” key to cancel the selected data.

BCM CURRENT SERVICE CODE

1. Clicking the “CURRENT SERVICE CODE” button from the menu window (Fig.107) displays the window. (Fig.114)
   This window shows failed item names and actions to be taken.

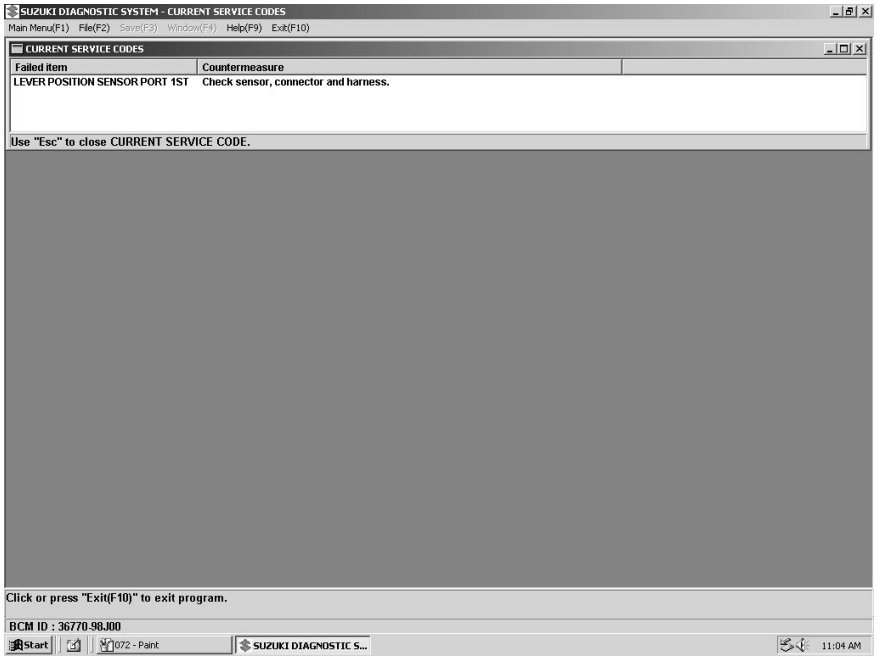


Fig.114

NOTE:

- *If there is no failed item, the message “No failure” appears in the CURRENT SERVICE CODES window.*
- *You can simultaneously display the service data window of the outboard motor (ECM) connected to the master BCM and CURRENT SERVICE CODES window.*
  To change the active window, click the “Window(F4)” button (“F4” key on the keyboard).

5-6. DATA GROUPS (BCM DATA ITEM GROUP TABLE)

The following table shows the groups to which each data item belongs.
Items with "√" mark can be freely selected and displayed.
Group No.1: Items that can be selected in master BCM service data
Group No.2: ECM on the PORT side (items that can be selected in the information sent via the master BCM)
Group No.3: ECM on the STBD side (items that can be selected in the information sent via the master BCM)
Group No.4: ECM on the CENTER side (items that can be selected in the information sent via the master BCM)

ITEM	UNIT	GROUP No.			
		1	2	3	4
ENGINE SPEED (PORT)	r/min	レ	レ		
ENGINE SPEED (STBD)	r/min	レ		レ	
ENGINE SPEED (CENTER)	r/min	レ			レ
LPS OUTPUT 1ST (P-M)	V	レ			
LPS OUTPUT 1ST (P-S)	V	レ			
LPS OUTPUT 1ST (S-M)	V	レ			
LPS OUTPUT 1ST (S-S)	V	レ			
LPS OUTPUT 2ND (P-M)	V	レ			
LPS OUTPUT 2ND (P-S)	V	レ			
LPS OUTPUT 2ND (S-M)	V	レ			
LPS OUTPUT 2ND (S-S)	V	レ			
ETV TRGT ANGLE (PORT)	V	レ	レ		
ETV TRGT ANGLE (STBD)	V	レ		レ	
ETV TRGT ANGLE (CENTER)	V	レ			レ
TPS OUTPUT (PORT)	V	レ	レ		
TPS OUTPUT (STBD)	V	レ		レ	
TPS OUTPUT (CENTER)	V	レ			レ
BATTERY VOLTAGE (BCM)	V	レ			
BATTERY VOLTAGE (PORT)	V	レ	レ		
BATTERY VOLTAGE (STBD)	V	レ		レ	
BATTERY VOLTAGE (CENTER)	V	レ			レ
TRIM ANGLE (PORT)	%	レ	レ		
TRIM ANGLE (STBD)	%	レ		レ	
TRIM ANGLE (CENTER)	%	レ			レ
BOAT SPEED	km/h	レ			
BOAT SPEED	knot	レ			
BOAT SPEED	mile/h	レ			
NO. OF LPS PORT 1ST	times	レ			
NO. OF LPS STBD 1ST	times	レ			
NO. OF LPS PORT 2ND	times	レ			
NO. OF LPS STBD 2ND	times	レ			
NO. OF LOW VOLTAGE 1ST	times	レ			
NO. OF CAN COMM FAILURE (SUB BCM)	times	レ			
NO. OF CAN COMM FAILURE (PORT)	times	レ	レ		
NO. OF CAN COMM FAILURE (STBD)	times	レ		レ	

ITEM	UNIT	GROUP No.			
		1	2	3	4
NO. OF CAN COMM FAILURE (CENTER)	times	レ			レ
NO. OF SET UP ERROR (SUB BCM)	times	レ			
NO. OF SET UP ERROR (PORT)	times	レ	レ		
NO. OF SET UP ERROR (STBD)	times	レ		レ	
NO. OF SET UP ERROR (CENTER)	times	レ			レ
NO. OF DBW ETV FAILURE (PORT)	times	レ	レ		
NO. OF DBW ETV FAILURE (STBD)	times	レ		レ	
NO. OF DBW ETV FAILURE (CENTER)	times	レ			レ
NO. OF DBW ESA FAILURE (PORT)	times	レ	レ		
NO. OF DBW ESA FAILURE (STBD)	times	レ		レ	
NO. OF DBW ESA FAILURE (CENTER)	times	レ			レ
SELECT SWITCH 1ST	ON/OFF	レ			
SELECT SWITCH 2ND	ON/OFF	レ			
START & STOP SW 1ST (PORT)	ON/OFF	レ	レ		
START & STOP SW 1ST (STBD)	ON/OFF	レ		レ	
START & STOP SW 1ST (CENTER)	ON/OFF	レ			レ
START & STOP SW 2ND (PORT)	ON/OFF	レ	レ		
START & STOP SW 2ND (STBD)	ON/OFF	レ		レ	
START & STOP SW 2ND (CENTER)	ON/OFF	レ			レ
EMERGENCY STOP SWITCH	ON/OFF	レ			
THROTTLE ONLY SWITCH 1ST	ON/OFF	レ			
THROTTLE ONLY SWITCH 2ND	ON/OFF	レ			
SYNC SWITCH 1ST	ON/OFF	レ			
SYNC SWITCH 2ND	ON/OFF	レ			
CENTER CTRL SWITCH 1ST	ON/OFF	レ			
CENTER CTRL SWITCH 2ND	ON/OFF	レ			
BUZZER RESET SWITCH	ON/OFF	レ			
SHIFT TRGT POSITION (PORT)	FORWARD NEUTRAL REVERSE	レ	レ		
SHIFT TRGT POSITION (STBD)	FORWARD NEUTRAL REVERSE	レ		レ	
SHIFT TRGT POSITION (CENTER)	FORWARD NEUTRAL REVERSE	レ			レ
SHIFT POSITION (PORT)	FORWARD NEUTRAL REVERSE	レ	レ		
SHIFT POSITION (STBD)	FORWAR NEUTRAL REVERSE	レ		レ	
SHIFT POSITION (CENTER)	FORWARD NEUTRAL REVERSE	レ			レ

EXPLANATION OF DATA ITEMS

ENGINE SPEED (PORT, STBD, CENTER) / r/min
Indicates the engine speed of the outboard motor in the range from 0 to 8 000 r/min.

LPS OUTPUT 1ST (P-M) / V
Indicates the voltage of the PORT side lever position sensor (main) in the remote control box of the 1st station in the range from 0 to 5 V.

LPS OUTPUT 1ST (P-S) / V
Indicates the voltage of the PORT side lever position sensor (sub) in the remote control box of the 1st station in the range from 0 to 5 V.

LPS OUTPUT 1ST (S-M) / V
Indicates the voltage of the STBD side lever position sensor (main) in the remote control box of the 1st station in the range from 0 to 5 V.

LPS OUTPUT 1ST (S-S) / V
Indicates the voltage of the STBD side lever position sensor (sub) in the remote control box of the 1st station in the range from 0 to 5 V.

LPS OUTPUT 2ND (P-M) / V
Indicates the voltage of the PORT side lever position sensor (main) in the remote control box of the 2nd station in the range from 0 to 5 V.

LPS OUTPUT 2ND (P-S) / V
Indicates the PORT side lever position sensor (sub) in the remote control box of the 2nd station in the range from 0 to 5 V.

LPS OUTPUT 2ND (S-M) / V
Indicates the voltage of the STBD side lever position sensor (main) in the remote control box of the 2nd station in the range from 0 to 5 V.

LPS OUTPUT 2ND (S-S) / V
Indicates the voltage of the STBD side lever position sensor (sub) in the remote control box of the 2nd station in the range from 0 to 5 V.

ETV TRGT ANGLE (PORT, STBD, CENTER) / V
Indicates the target opening voltage transmitted from the master BCM to PORT outboard motor ECM in the range from 0 to 5 V.

TPS OUTPUT (PORT, STBD, CENTER) / V
Indicates the throttle opening voltage transmitted from ECM of the outboard motor to the master BCM in the range from 0 to 5 V.

BATTERY VOLTAGE (BCM) / V
Indicates the input voltage of BCM in the range from 6 to 16 V.

BATTERY VOLTAGE (PORT, STBD, CENTER) / V
Indicates the ECM input voltage transmitted from the ECM of the outboard motor to the master BCM in the range from 6 to16 V.

TRIM ANGLE (PORT, STBD, CENTER) / %
Indicates the trim sensor angle transmitted from ECM of the outboard motor to the master BCM in the range from 0 to 100%. 0% indicates the full trim down and 100% the full trim up.

BOAT SPEED (through water)/ km/h, knot, mile/h
Indicates the log speed transmitted from ECM of outboard motor to master BCM in the range from 0 to 160 km/h (0 to 100 knot, 0 to 100 mile/h).

NO. OF LPS (PORT, STBD) (1ST, 2ND) / times
Counts if the value of the (main and sub) lever position sensor control voltage in the remote control box is out of the specified range of the upper and lower limits.

NO. OF LOW VOLTAGE 1ST / times
Counts if the dropped voltage continues for longer time than specified.

NO. OF CAN COMM FAILURE (SUB BCM, PORT, STBD, CENTER) / times
Counts if data is not periodically received.

NO. OF SET UP ERROR (SUB BCM, PORT, STBD, CENTER) / times
Counts if no validation is demanded from the sub BCM or ECM of the outboard motor to master BCM.

NO. OF DBW ETV FAILURE (PORT, STBD, CENTER) / times
Counts if mismatch between the actual throttle opening of the outboard motor and the target opening continues longer than specified.

NO. OF DBW ESA FAILURE (PORT, STBD, CENTER) / times
Counts if mismatch between the actual shift position and the target shift position due to a reason other than engine failure continues longer than specified.

SELECT SWITCH (1ST, 2ND) / ON/OFF
Indicates the select switch status by ON or OFF.
Select switch 1st “ON” means that the 1st station is effective.

START & STOP SWITCH, 1ST, 2ND (PORT, STBD, CENTER) / ON/OFF
Indicates the start & stop switch status by ON or OFF.
By pressing the switch to start or stop the engine, the switch is turned ON and when you leave your hand, it is turned OFF.

EMERGENCY STOP SWITCH/ ON/OFF
Indicates the emergency stop switch status by ON or OFF.
When the lock plate is inserted into the emergency stop switch, the switch is turned “OFF”.

THROTTLE ONLY SWITCH (1ST, 2ND) / ON/OFF
Indicates the throttle only switch status by ON or OFF.
By shifting the remote control lever to forward or reverse with the throttle only switch “ON”, racing the engine becomes possible with the gear in the neutral position.

SYNC SWITCH (1ST, 2ND)/ ON/OFF
Indicates the synchronization switch status by ON or OFF.
When starting 2 or more engines, turn on the synchronization switch “ON” and then match the r/min of each engine to the PORT side outboard motor.
In the initialization, the switch is at “ON”.

CENTER CTRL SWITCH (1ST, 2ND)/ ON/OFF
Indicates the center control switch status by ON or OFF.
When starting engines, the PORT side outboard motor and CENTER side outboard motor are operated at mutual linkage.
Those engines are linked by turning the switch “ON” and unlinked by turning it “OFF”.
In the initialization, the switch is at “ON”.

BUZZER RESET SWITCH/ ON/OFF
Indicates the buzzer reset switch status by ON or OFF.
When ECM monitors the engine status and a caution buzzer sounds, the caution buzzer can be stopped by pushing the main switch key.

SHIFT TRGT POSITION (PORT, STBD, CENTOR)/FORWARD/NEUTRAL/REVERSE
Information entered to BCM is transmitted as the control command from the LPS sensor to ECM of the outboard motor and the target shift position at this position is indicated.

SHIFT POSITION (PORT, STBD, CENTER)
ECM controls the actuator by the control command transmitted from BCM to ECM of the outboard motor and the shift position at this time is indicated.

5-7. BCM INITIALIZATION

Initialize the information registered in the BCM.

1. Clicking the “BCM INITIALIZATION” button from the Main Menu dialog box (Fig.85) displays the menu window. (Fig.115)

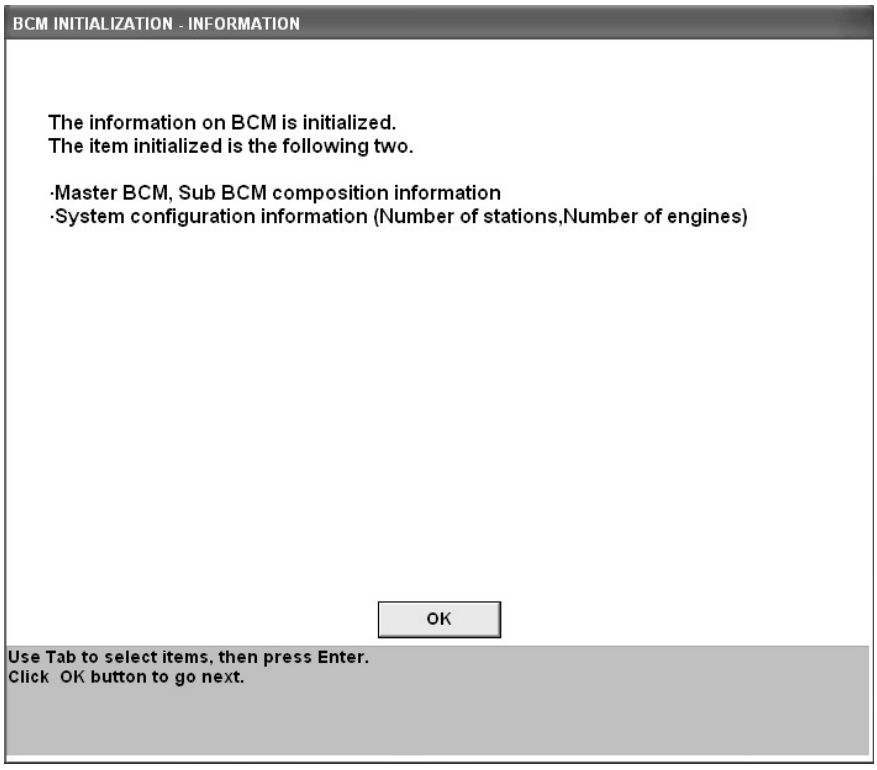


Fig.115

2. Delete the (master or sub) BCM information registered in the BCM after system calibration and system configuration information (*Number of engine, Number of station).
   Click the “OK” button and proceed to the next step.
   (Keyboard) Move to the “OK” button using the “Tab” key and press the “Enter” key.

3. The following BCM INITIALIZATION-CAUTION window appears. (Fig.116)
   Read the messages and follow the instruction. Then click the “OK” button and proceed to the next step.
   To cancel BCM information deletion, click the “Cancel” button or press the “Esc” key on the keyboard.
   (Keyboard) To delete BCM information, move to the “OK” button by using the “Tab” key and press the “Enter” key to have the deletion accepted. To cancel BCM information deletion, move to the “Cancel” button by using the “Tab” key and press the “Enter” key to have the cancellation accepted.

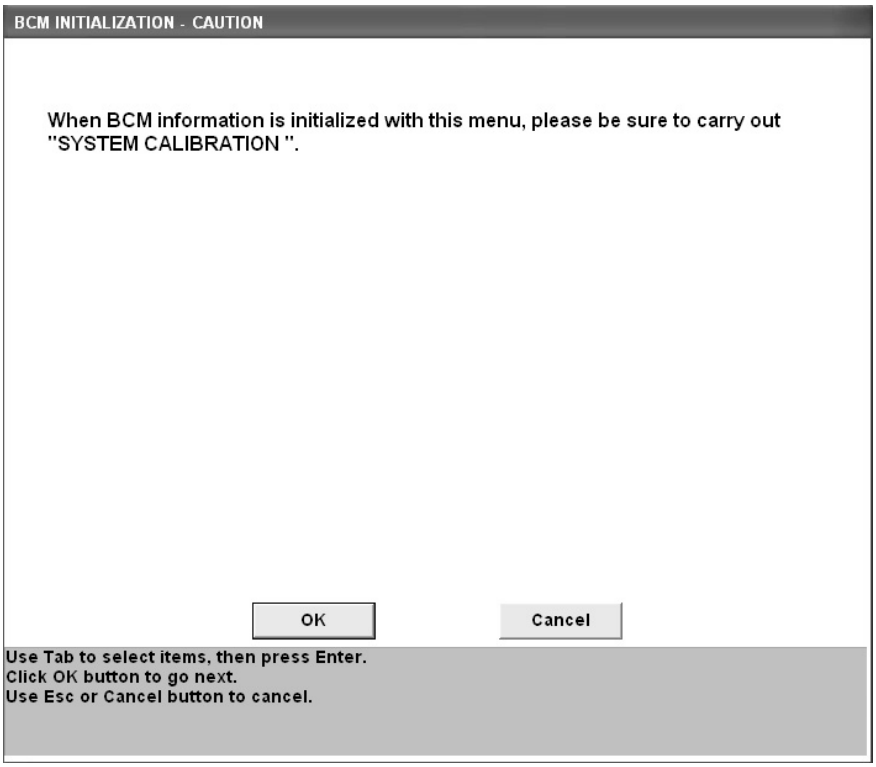


Fig.116

4. The following window appears (Fig.117):
   Clicking the “Yes” button deletes BCM information.
   Clicking the “No” button cancels BCM information deletion.

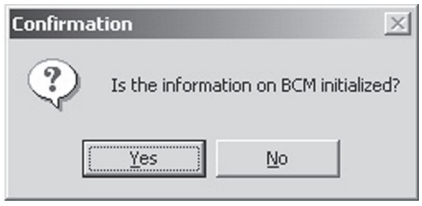


Fig.117

NOTE:

- *By clicking the “OK” button, the initialization of BCM information is completed. Click the “OK” button (Fig.118), turn “OFF” the engine switch (main switch) and turn it “ON” again.*
- *If the initialization of BCM information fails, an error message is indicated.*
  Click the “OK” button (Fig.119) and start from the step 1 again.

Fig.118

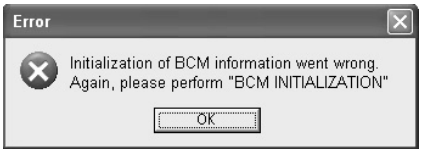
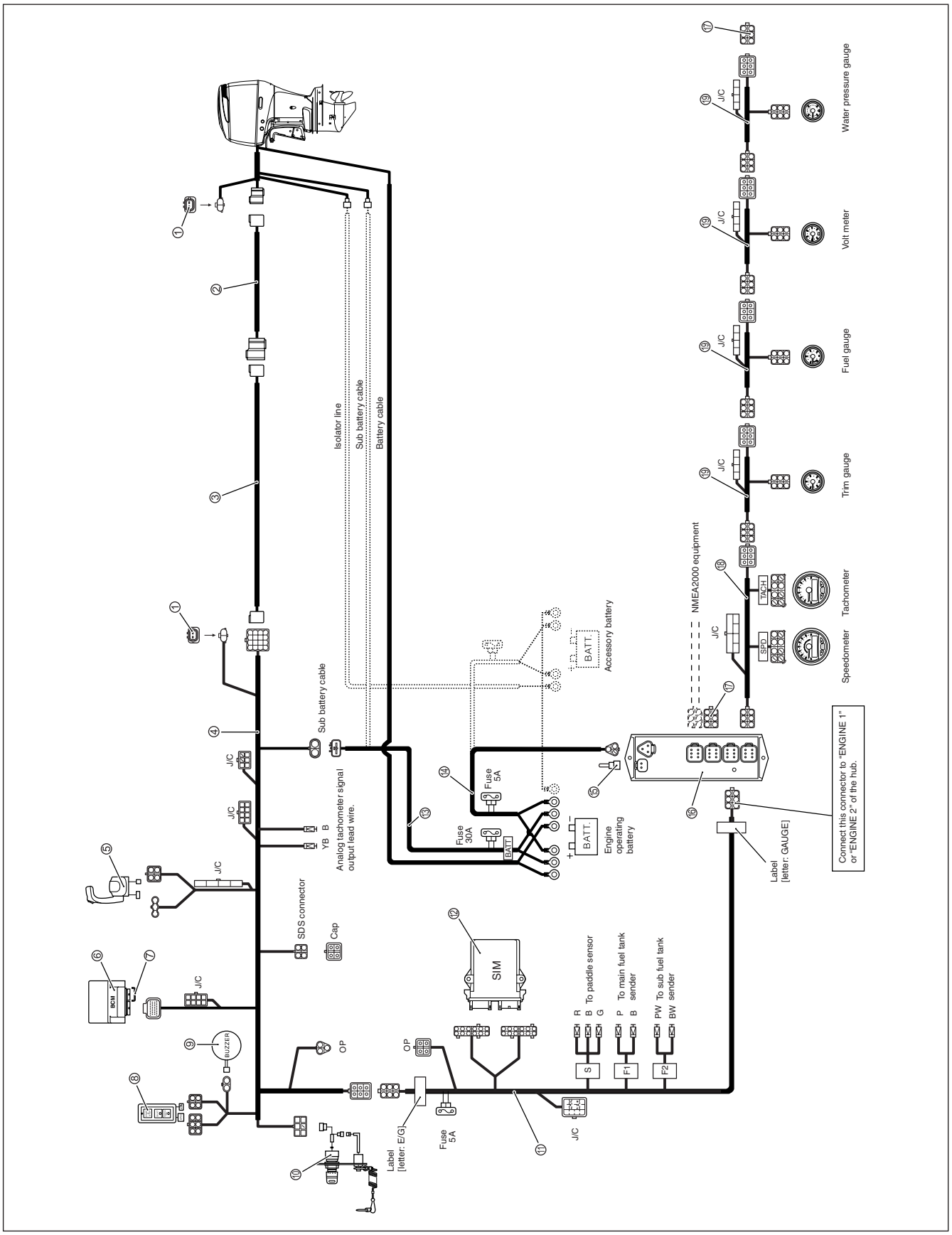


Fig.119

—— MEMO ——

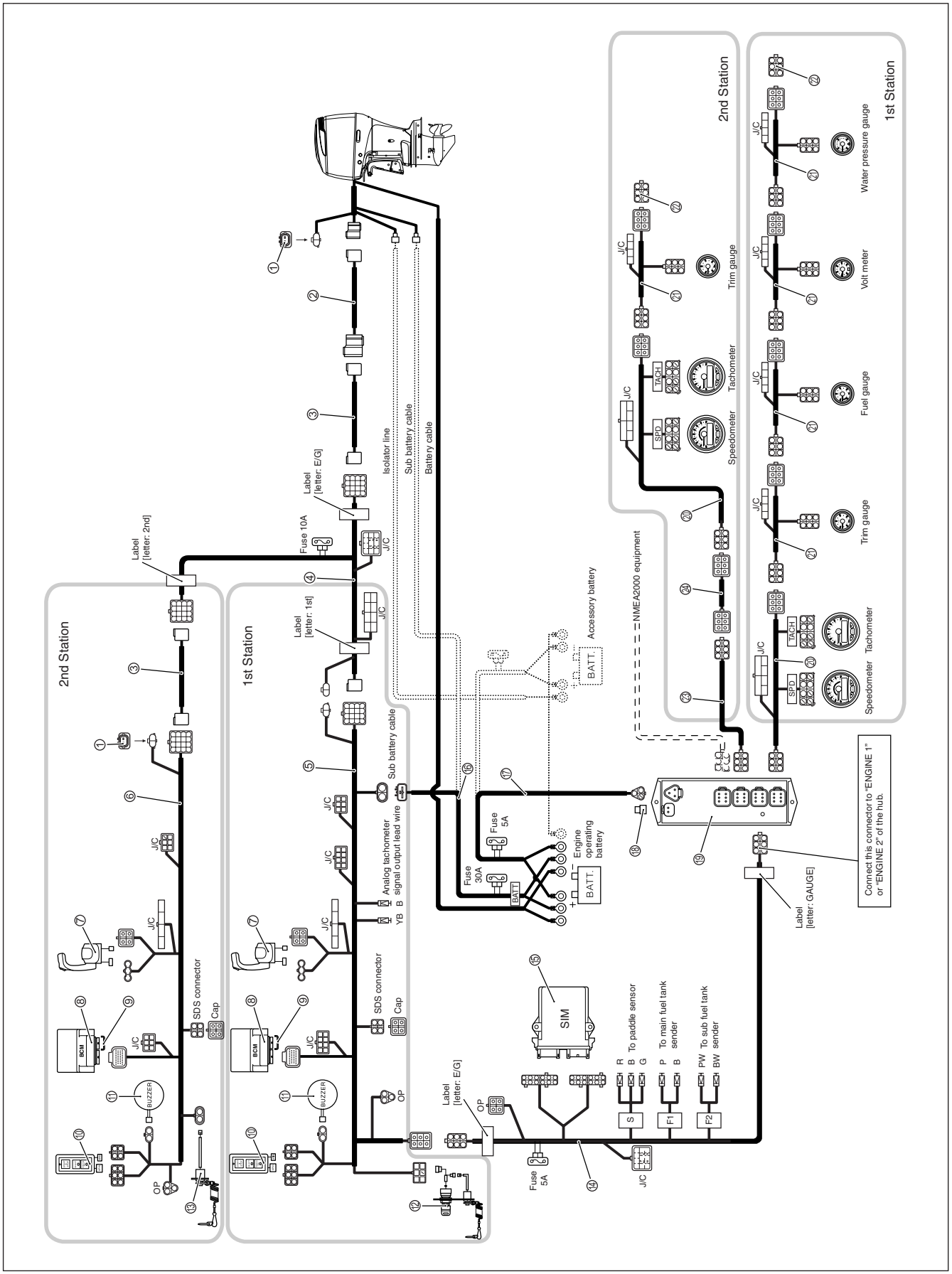
5-8. WIRING (With Teleflex Gauge)

5-8-1. SINGLE ENGINE, SINGLE STATION



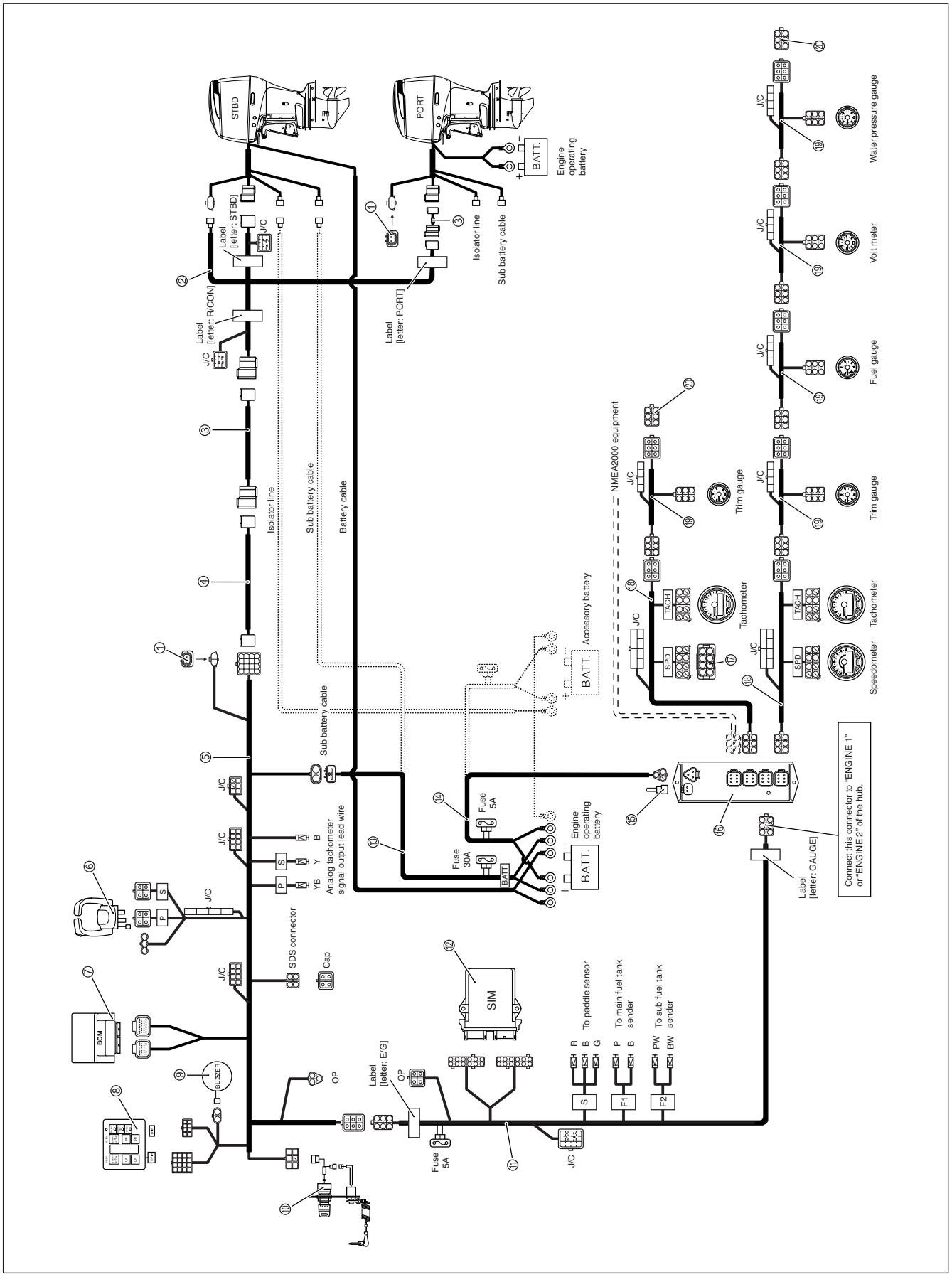
No.	Part Name	Part No.	QTY
①	RESISTOR, TERMINAL	33926-98J00	2
②	EXT WIRE HARNESS, REMOTE CONTROL (2.0 m)	36620-98J20	CHOICE (1)
③	MAIN WIRE HARNESS, REMOTE CONTROL (6.5 m)	36620-98J00	CHOICE (1)
	MAIN WIRE HARNESS, REMOTE CONTROL (9.5 m)	36620-98J10	
④	HARNESS ASSY, BCM No.1 FOR SNGL	36623-98J01	1
⑤	REMOTE CONTROL ASSY, TOP MOUNT	67200-98J01	1
⑥	CONTROLLER ASSY, BOAT ELECTRIC	36770-98J01	1
⑦	CAP, BCM CONNECTOR	33911-88BL0	1
⑧	PANEL ASSY, SINGLE	37100-98J11	1
⑨	BUZZER ASSY, WARNING	38500-93J90	1
⑩	PANEL ASSY, MAIN SW	37100-98J00	1
⑪	HARNESS ASSY, INTERFACE UNIT	36661-98J00	1
⑫	UNIT, INTERFACE	34922-98J01	1
⑬	HARNESS ASSY, BATTERY (2 m)	36625-98J00	1
⑭	HARNESS ASSY, ACTIVE HUB PWR (2.5 m)	36663-98J00	CHOICE (1)
	HARNESS ASSY, ACTIVE HUB PWR (6.0 m)	36663-98J10	
⑮	WIRE COMP, JUMPER	36665-98J00	1
⑯	UNIT, ACTIVE HUB	34921-98J00	1
⑰	CAP, 6-PIN CONNECTOR	36666-98J10	2
⑱	HARNESS ASSY, 3” GAUGE	36664-98J00	1
⑲	HARNESS ASSY, 2” GAUGE	36664-98J10	4

5-8-2. SINGLE ENGINE, DUAL STATIONS



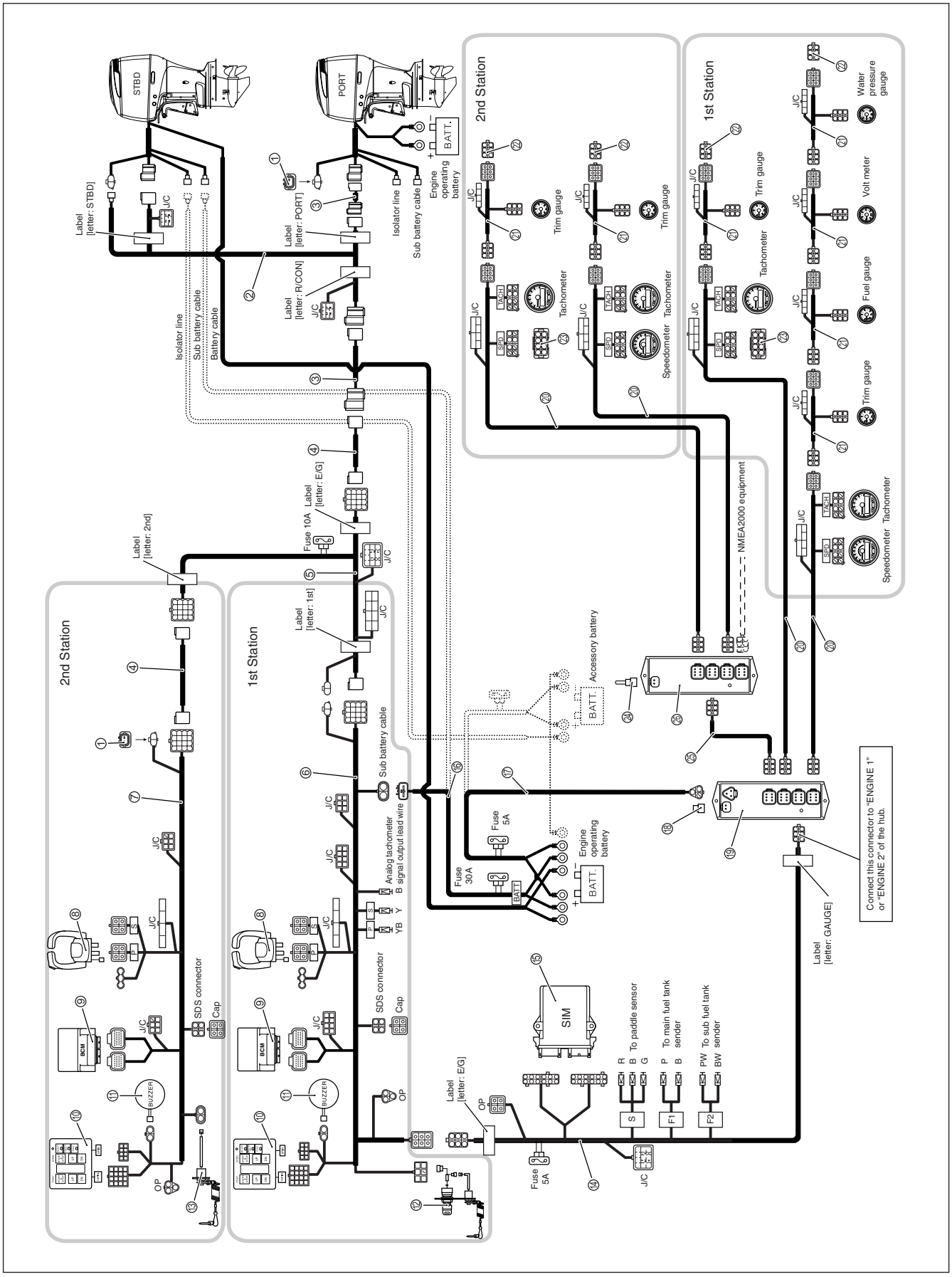
No.	Part Name	Part No.	QTY
①	RESISTOR, TERMINAL	33926-98J00	2
②	EXT WIRE HARNESS, REMOTE CONTROL (2.0 m)	36620-98J20	CHOICE (1)
③	MAIN WIRE HARNESS, REMOTE CONTROL (6.5 m)	36620-98J00	CHOICE (1)
	MAIN WIRE HARNESS, REMOTE CONTROL (9.5 m)	36620-98J10	
④	HARNESS ASSY, DUAL STATION	36622-98J00	1
⑤	HARNESS ASSY, BCM No.1 FOR SNGL	36623-98J01	1
⑥	HARNESS ASSY, BCM No.2 FOR SNGL	36624-98J01	1
⑦	REMOTE CONTROL ASSY, TOP MOUNT	67200-98J01	1
⑧	CONTROLLER ASSY, BOAT ELECTRIC	36770-98J01	1
⑨	CAP, BCM CONNECTOR	33911-88BL0	1
⑩	PANEL ASSY, SINGLE	37100-98J11	1
⑪	BUZZER ASSY, WARNING	38500-93J90	1
⑫	PANEL ASSY, MAIN SW	37100-98J00	1
⑬	PANEL ASSY, EMERGENCY SW	37803-93J00	1
⑭	HARNESS ASSY, INTERFACE UNIT	36661-98J00	1
⑮	UNIT, INTERFACE	34922-98J01	1
⑯	HARNESS ASSY, BATTERY (2 m)	36625-98J00	1
⑰	HARNESS ASSY, ACTIVE HUB PWR (2.5 m)	36663-98J00	CHOICE (1)
	HARNESS ASSY, ACTIVE HUB PWR (6.0 m)	36663-98J10	
⑱	CAP, 2-PIN CONNECTOR	36667-98J00	1
⑲	UNIT, ACTIVE HUB	34921-98J00	1
⑳	HARNESS ASSY, 3” GAUGE	36664-98J00	1
㉑	HARNESS ASSY, 2” GAUGE	36664-98J10	5
㉒	CAP, 6-PIN CONNECTOR	36666-98J10	2
㉓	HARNESS ASSY, 2” HUB (1 m)	36662-98J00	CHOICE (1)
	HARNESS ASSY, 2” HUB (6.5 m)	36662-98J10	
㉔	HARNESS ASSY, RESISTOR	36668-98J00	1

5-8-3. TWIN ENGINES, SINGLE STATION



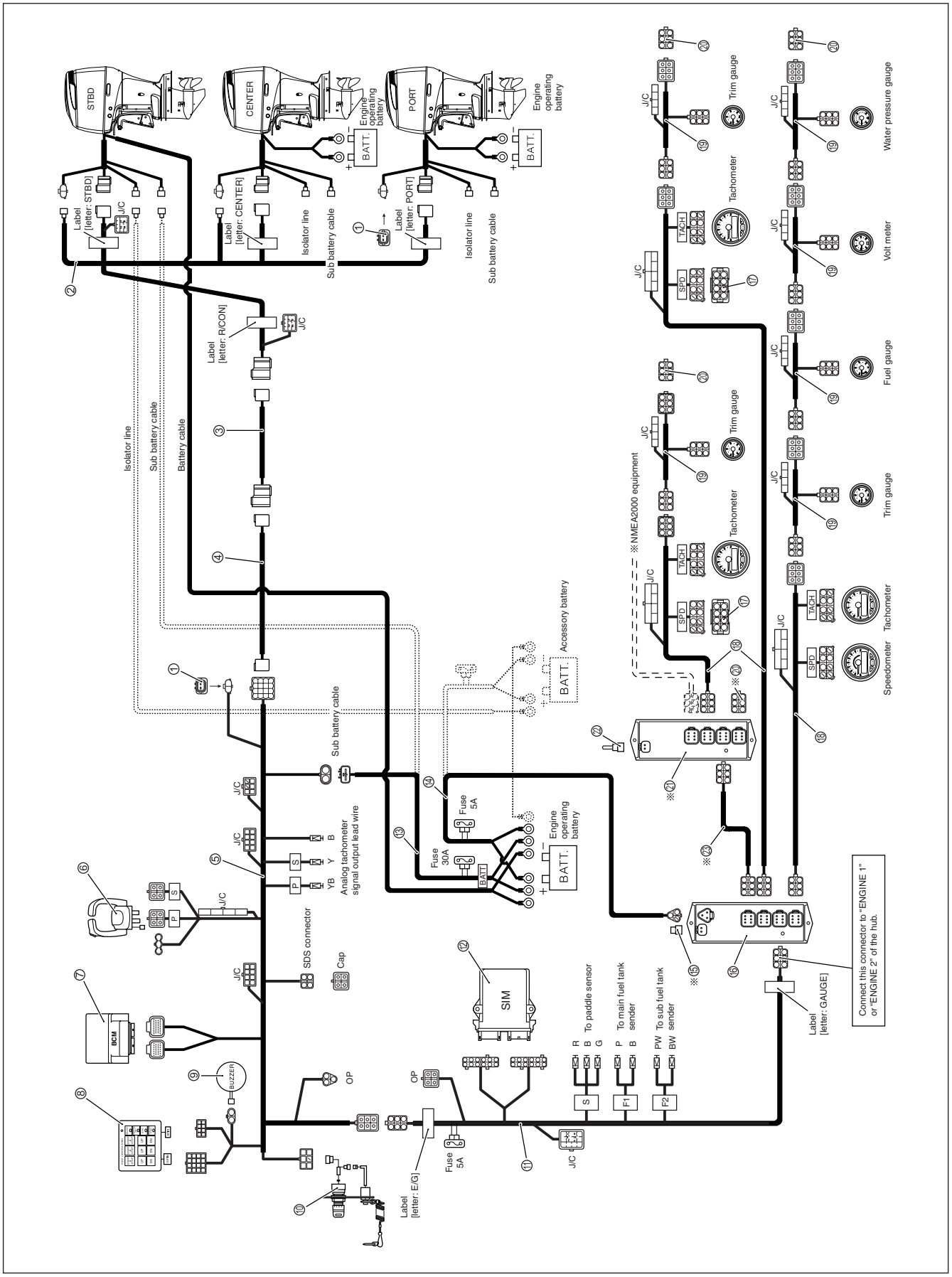
No.	Part Name	Part No.	QTY
①	RESISTOR, TERMINAL	33926-98J00	2
②	HARNESS ASSY, DUAL ENGINE	36621-98J00	1
③	EXT WIRE HARNESS, REMOTE CONTROL (2.0 m)	36620-98J20	CHOICE (2)
④	MAIN WIRE HARNESS, REMOTE CONTROL (6.5 m)	36620-98J00	CHOICE (1)
	MAIN WIRE HARNESS, REMOTE CONTROL (9.5 m)	36620-98J10	
⑤	HARNESS ASSY, BCM No.1 FOR MULT	36623-98J11	1
⑥	REMOTE CONTROL ASSY, TOP MOUNT DUAL	67200-98J11	1
⑦	CONTROLLER ASSY, BOAT ELECTRIC	36770-98J01	1
⑧	PANEL ASSY, DUAL	37100-98J21	1
⑨	BUZZER ASSY, WARNING	38500-93J90	1
⑩	PANEL ASSY, MAIN SW	37100-98J00	1
⑪	HARNESS ASSY, INTERFACE UNIT	36661-98J00	1
⑫	UNIT, INTERFACE	34922-98J01	1
⑬	HARNESS ASSY, BATTERY (2 m)	36625-98J00	1
⑭	HARNESS ASSY, ACTIVE HUB PWR (2.5 m)	36663-98J00	CHOICE (1)
	HARNESS ASSY, ACTIVE HUB PWR (6.0 m)	36663-98J10	
⑮	WIRE COMP, JUMPER	36665-98J00	1
⑯	UNIT, ACTIVE HUB	34921-98J00	1
⑰	CAP, 8-PIN CONNECTOR	36666-98J00	1
⑱	HARNESS ASSY, 3” GAUGE	36664-98J00	2
⑲	HARNESS ASSY, 2” GAUGE	36664-98J10	5
⑳	CAP, 6-PIN CONNECTOR	36666-98J10	2

5-8-4. DUAL ENGINE, DUAL STATIONS



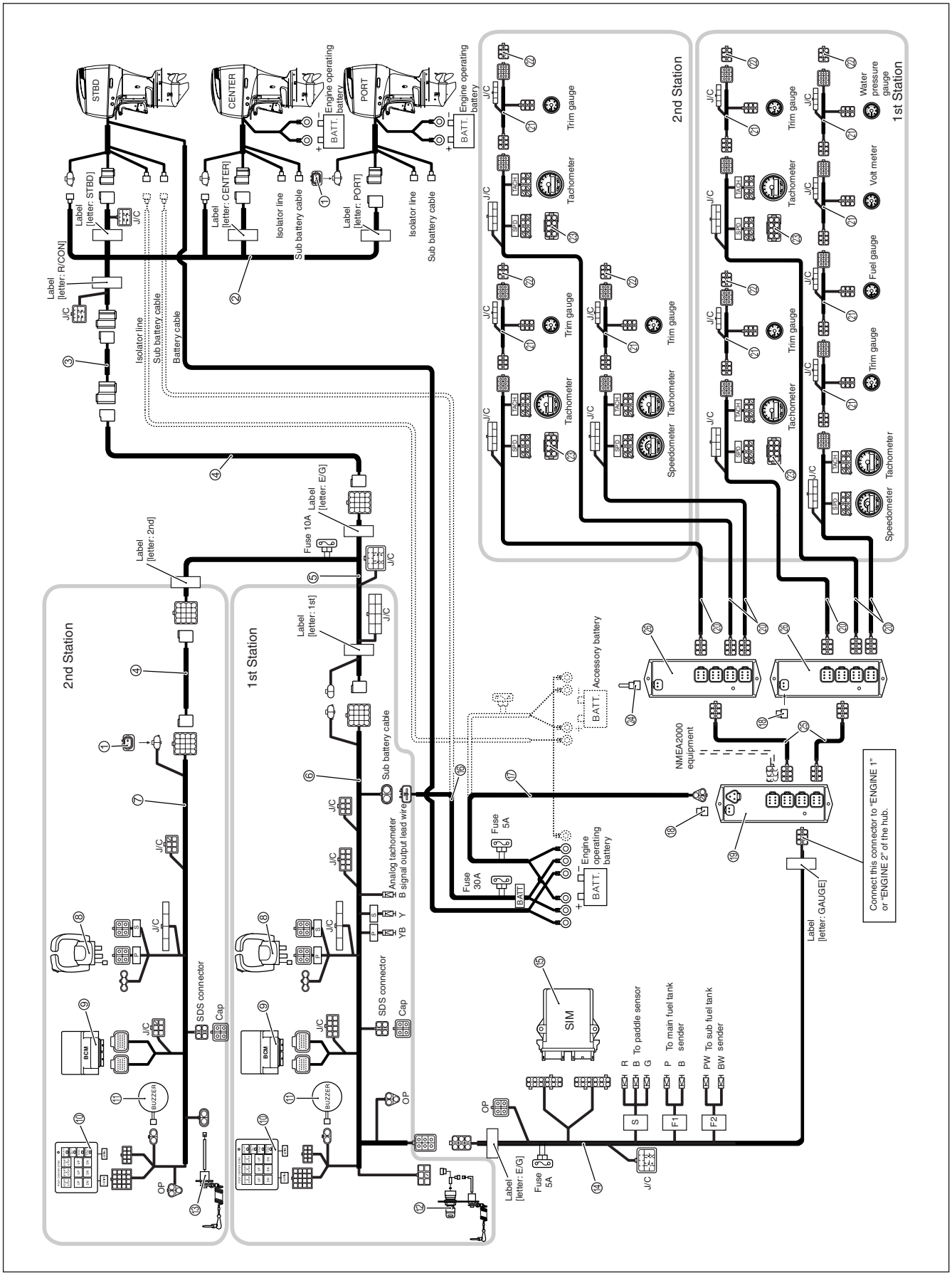
No.	Part Name	Part No.	QTY
①	RESISTOR, TERMINAL	33926-98J00	2
②	HARNESS ASSY, DUAL ENGINE	36621-98J00	1
③	EXT WIRE HARNESS, REMOTE CONTROL (2.0 m)	36620-98J20	CHOICE (2)
④	MAIN WIRE HARNESS, REMOTE CONTROL (6.5 m)	36620-98J00	CHOICE (2)
	MAIN WIRE HARNESS, REMOTE CONTROL (9.5 m)	36620-98J10	
⑤	HARNESS ASSY, DUAL STATION	36622-98J00	1
⑥	HARNESS ASSY, BCM No.1 FOR MULT	36623-98J11	1
⑦	HARNESS ASSY, BCM No.2 FOR MULT	36624-98J10	1
⑧	REMOTE CONTROL ASSY, TOP MOUNT DUAL	67200-98J11	2
⑨	CONTROLLER ASSY, BOAT ELECTRIC	36770-98J01	2
⑩	PANEL ASSY, DUAL	37100-98J21	2
⑪	BUZZER ASSY, WARNING	38500-93J90	2
⑫	PANEL ASSY, MAIN SW	37100-98J00	1
⑬	PANEL ASSY, EMERGENCY SW	37803-93J00	1
⑭	HARNESS ASSY, INTERFACE UNIT	36661-98J00	1
⑮	UNIT, INTERFACE	34922-98J01	1
⑯	HARNESS ASSY, BATTERY (2 m)	36625-98J00	1
⑰	HARNESS ASSY, ACTIVE HUB PWR (2.5 m)	36663-98J00	CHOICE (1)
	HARNESS ASSY, ACTIVE HUB PWR (6.0 m)	36663-98J10	
⑱	CAP, 2-PIN CONNECTOR	36667-98J00	1
⑲	UNIT, ACTIVE HUB	34921-98J00	1
⑳	HARNESS ASSY, 3” GAUGE	36664-98J00	4
㉑	HARNESS ASSY, 2” GAUGE	36664-98J10	7
㉒	CAP, 6-PIN CONNECTOR	36666-98J10	4
㉓	CAP, 8-PIN CONNECTOR	36666-98J00	2
㉔	WIRE COMP JUMPER	36665-98J00	1
㉕	HARNESS ASSY, 2” HUB (1 m)	36662-98J00	CHOICE (1)
	HARNESS ASSY, 2” HUB (6.5 m)	36662-98J10	
㉖	UNIT, PASSIVE HUB	34921-98J10	1

5-8-5. TRIPLE ENGINES, SINGLE STATION



No.	Part Name	Part No.	QTY
①	RESISTOR, TERMINAL	33926-98J00	2
②	HARNESS ASSY, TRIPLE ENGINE	36621-98J10	1
③	EXT WIRE HARNESS, REMOTE CONTROL (2.0 m)	36620-98J20	CHOICE (1)
④	MAIN WIRE HARNESS, REMOTE CONTROL (6.5 m)	36620-98J00	CHOICE (1)
	MAIN WIRE HARNESS, REMOTE CONTROL (9.5 m)	36620-98J10	
⑤	HARNESS ASSY, BCM No.1 FOR MULT	36623-98J11	1
⑥	REMOTE CONTROL ASSY, TOP MOUNT DUAL	67200-98J11	1
⑦	CONTROLLER ASSY, BOAT ELECTRIC	36770-98J01	1
⑧	PANEL ASSY, TRIPLE	37100-98J31	1
⑨	BUZZER ASSY, WARNING	38500-93J90	1
⑩	PANEL ASSY, MAIN SW	37100-98J00	1
⑪	HARNESS ASSY, INTERFACE UNIT	36661-98J00	1
⑫	UNIT, INTERFACE	34922-98J01	1
⑬	HARNESS ASSY, BATTERY (2 m)	36625-98J00	1
⑭	HARNESS ASSY, ACTIVE HUB PWR (2.5 m)	36663-98J00	CHOICE (1)
	HARNESS ASSY, ACTIVE HUB PWR (6.0 m)	36663-98J10	
⑮	CAP, 2-PIN CONNECTOR	36667-98J00	1
⑯	UNIT, ACTIVE HUB	34921-98J00	1
⑰	CAP, 8-PIN CONNECTOR	36666-98J00	2
⑱	HARNESS ASSY, 3” GAUGE	36664-98J00	3
⑲	HARNESS ASSY, 2” GAUGE	36664-98J10	6
⑳	CAP, 6-PIN CONNECTOR	36666-98J10	4
㉑	UNIT, PASSIVE HUB	34921-98J10	1
㉒	WIRE COMP, JUMPER	36665-98J00	1
㉓	HARNESS ASSY, 2” HUB (1 m)	36662-98J00	CHOICE (1)
	HARNESS ASSY, 2” HUB (6.5 m)	36662-98J10	

5-8-6. TRIPLE ENGINES, DUAL STATIONS



No.	Part Name	Part No.	QTY
①	RESISTOR, TERMINAL	33926-98J00	2
②	HARNESS ASSY, TRIPLE ENGINE	36621-98J10	1
③	EXT WIRE HARNESS, REMOTE CONTROL (2.0 m)	36620-98J20	CHOICE (2)
④	MAIN WIRE HARNESS, REMOTE CONTROL (6.5 m)	36620-98J00	CHOICE (2)
	MAIN WIRE HARNESS, REMOTE CONTROL (9.5 m)	36620-98J10	
⑤	HARNESS ASSY, DUAL STATION	36622-98J00	1
⑥	HARNESS ASSY, BCM No.1 FOR MULT	36623-98J11	1
⑦	HARNESS ASSY, BCM No.2 FOR MULT	36624-98J10	1
⑧	REMOTE CONTROL ASSY, TOP MOUNT DUAL	67200-98J11	2
⑨	CONTROLLER ASSY, BOAT ELECTRIC	36770-98J01	2
⑩	PANEL ASSY, TRIPLE	37100-98J31	2
⑪	BUZZER ASSY, WARNING	38500-93J90	2
⑫	PANEL ASSY, MAIN SW	37100-98J00	1
⑬	PANEL ASSY, EMERGENCY SW	37803-93J00	1
⑭	HARNESS ASSY, INTERFACE UNIT	36661-98J00	1
⑮	UNIT, INTERFACE	34922-98J01	1
⑯	HARNESS ASSY, BATTERY (2 m)	36625-98J00	1
⑰	HARNESS ASSY, ACTIVE HUB PWR (2.5 m)	36663-98J00	CHOICE (1)
	HARNESS ASSY, ACTIVE HUB PWR (6.0 m)	36663-98J10	
⑱	CAP, 2-PIN CONNECTOR	36667-98J00	1
⑲	UNIT, ACTIVE HUB	34921-98J00	1
⑳	HARNESS ASSY, 3” GAUGE	36664-98J00	6
㉑	HARNESS ASSY, 2” GAUGE	36664-98J10	9
㉒	CAP, 6-PIN CONNECTOR	36666-98J10	6
㉓	CAP, 8-PIN CONNECTOR	36666-98J00	4
㉔	WIRE COMP JUMPER	36665-98J00	1
㉕	HARNESS ASSY, 2” HUB (1 m)	36662-98J00	CHOICE (2)
	HARNESS ASSY, 2” HUB (6.5 m)	36662-98J10	
㉖	UNIT, PASSIVE HUB	34921-98J10	2

6. UNINSTALLING THE SDS PROGRAM

Uninstall (delete) the SDS program from your PC.

NOTE:
Check that all other programs have exited before uninstalling the SDS program.

1. From the task bar of your PC, click the “Start” button and select “Control Panel”. The following dialog box appears. (Fig.120)

Fig.120

2. Click the Add/Remove Programs icon. (Fig.120)
   The Add/Remove Program Properties dialog box appears. (Fig.121)
   Select “SUZUKI DIAGNOSTIC SYSTEM” and click the “Change/Remove” button.

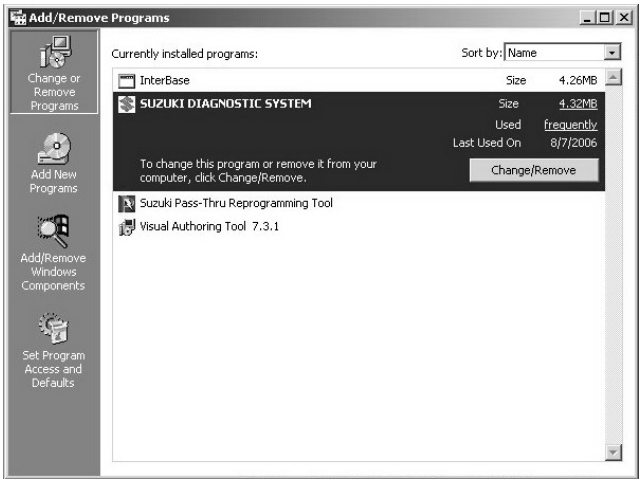


Fig.121

3. SDS program uninstallation is automatically started. (Fig.122)
4. Check that the uninstallation has finished and click the “Finish” button. (Fig.123)

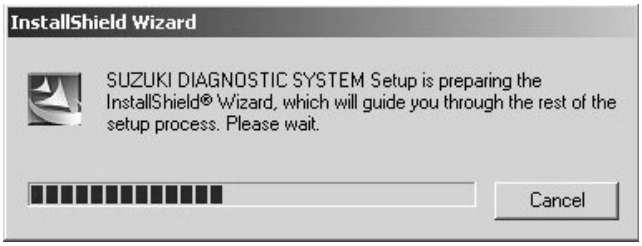


Fig.122

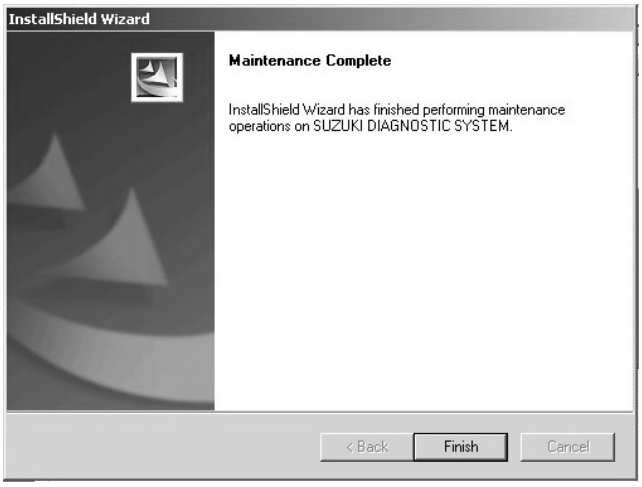


Fig.123

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